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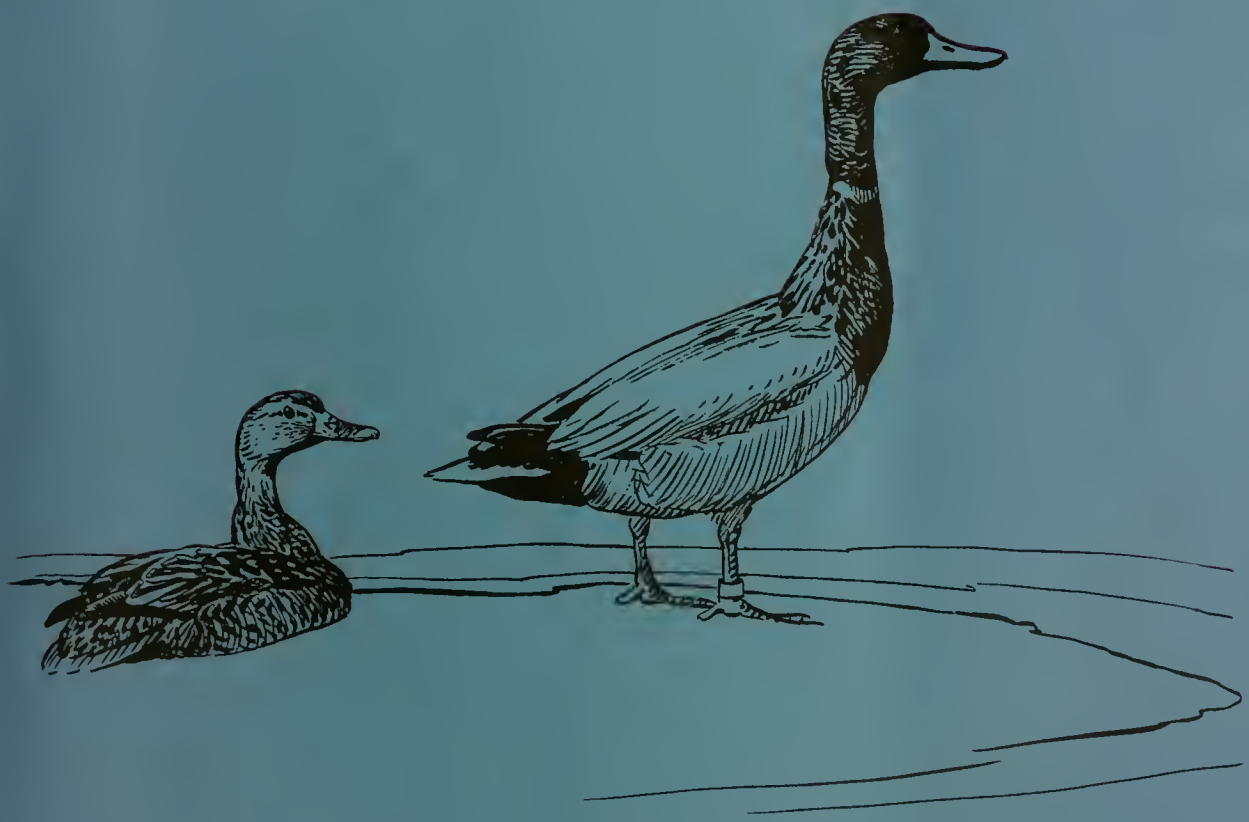

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
BUREAU OF SPORT FISHERIES AND WILDLIFE
Special Scientific Report—Wildlife No. 138

UNITED STATES DEPARTMENT OF THE INTERIOR
Fish and Wildlife Service
Bureau of Sport Fisheries and Wildlife

WATERFOWL STATUS REPORT, 1970

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DIVISION OF MANAGEMENT AND ENFORCEMENT

in collaboration with

DIVISION OF WILDLIFE RESEARCH

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WATERFOWL STATUS REPORT

1970

Information from surveys of the breeding and wintering grounds of waterfowl coupled with data from mail surveys of hunters play a major role in the development of annual hunting regulations for waterfowl. This report presents tabulations of the 1970 waterfowl population and habitat surveys and the results of mail surveys of waterfowl hunters for the 1969-70 season.

Credit has been given to each individual or organization that submitted a report. Although many of the narrative statements have been briefed, and a few tables deleted or shortened if they contained data submitted previously or in another form, the essential information from each report has been retained to the greatest extent possible. Figure 1 in the Appendix shows breeding ground survey strata for the several areas surveyed by Bureau of Sport Fisheries and Wildlife crews.

WINTER SURVEY

During the first half of January, a survey of waterfowl on their wintering grounds was completed by the Bureau of Sport Fisheries and Wildlife with assistance from State conservation departments, other Federal agencies, and private individuals. All important waterfowl areas in the United States (plus the major wintering areas in Mexico) were surveyed. These data are presented in Tables A-1, A-2, and A-3 (Mexico).

PACIFIC FLYWAY

Data supplied by John E. Chattin, Bureau of Sport Fisheries and Wildlife

The 1970 winter survey was completed on schedule, with no serious operational difficulties. Fog and cold weather in Montana and Wyoming, plus haze, fog, and smoke in California were the principal weather problems. All other States had good weather and the counts were completed with no delay.

Total waterfowl were up about 41 percent from 1969 and about 10 percent from the 16-year average. The biggest change was in dabbling ducks which were up 56 percent from 1969 and about 22 percent from the 16-year average. Divers were down about 30 percent from 1969 and 33 percent from the 16-year average. Geese and brant were up about 19 percent from 1969 but down 2 percent from the 16-year average.

CENTRAL FLYWAY

Data supplied by Raymond J. Buller, Bureau of Sport Fisheries and Wildlife

Although winter weather conditions caused some operational problems, prolonging the survey in some parts of the flyway, it is felt that this did not materially effect the results. Field reports indicated that although much of the northern portion of the flyway was snow-covered, about 95 percent of the total wintering population was surveyed.

The dabbling duck index was about 60 percent above 1969, and 45 percent and 29 percent above the 10- and 15-year averages. Redheads were up 28 percent over 1969 but significantly below the long-term averages.

The total duck index was about 62 percent above 1969 and 30 percent and 20 percent above the long-term averages.

The total goose index was up 3 percent for an all-time high. Blue/snow geese declined by 21 percent, but Canadas and whitefronts increased 32 percent and 42 percent, respectively.

MISSISSIPPI FLYWAY

Data supplied by Arthur S. Hawkins and Rossalius C. Hanson, Bureau of Sport Fisheries and Wildlife

The Region 3 portion of the flyway had normal winter weather and the survey was completed during the period January 5-9. This segment of the survey is considered comparable to 1969.

Operational difficulties plagued the survey crews in the Region 4 portion of the flyway. Here, as in Region 3, the survey was started on January 5 but not completed until January 10 in Mississippi, January 15 in Kentucky, January 16 in Tennessee, and January 21 in Louisiana. The delays allow for the possibility of population shifts and in fact, a major migration of waterfowl was observed during the inventory period. However, in spite of these problems, the overall figures show a general increase over 1969, total waterfowl being up 12 percent from 1969 and 39 percent over the 22-year average. Canada geese were down about 10 percent from 1969 but 53 percent above the 22-year average. Blue/snow geese increased from 1969 but were below the long-time average. Whitefronts were up from 1969 and the long-term average.

ATLANTIC FLYWAY

Data supplied by C. E. Addy, Bureau of Sport Fisheries and Wildlife

Record low temperatures accompanied by ice, snow, and sleet were prevalent throughout much of the flyway during the survey period. Ponds and lakes were frozen as far south as southern Georgia. Because this was such a change from conditions during the 1969 survey, it is probable that the surveys are not comparable. Despite the adverse conditions, the survey was completed during the period January 5-16. In addition to the weather, changes in survey crews undoubtedly contributed to the fact that the 1970 results are not directly comparable to 1969.

According to the survey, total waterfowl were down about 14 percent from 1969 and nearly 22 percent from the 20-year average. Canada geese were about 14 percent above 1969 and almost 73 percent above the 20-year average. The count of snow geese was down 54 percent from 1969, but it is suspected that an incomplete census rather than a population decrease was the cause. Brant were down 19 percent from 1969 and nearly 40 percent from the 20-year average.

Dabbling ducks were down about 8 percent from 1969 and 23 percent from the 20-year average. Diving ducks were down 35 percent from 1969 and nearly 43 percent from the 20-year average.

In Puerto Rico, 185 waterfowl were recorded as compared to 315 in 1969 and 2,000 in 1968.

MEXICO

For the first time since 1965, surveys were made of wintering waterfowl in three parts of Mexico utilizing three Bureau aircraft and three crews. The survey areas were the East Coast, Central Interior Highlands, and West Coast.

EAST COAST

Data supplied by Flyway Biologists Arthur R. Brazda and Donald N. Frickie, Bureau of Sport Fisheries and Wildlife

This survey covered the area from the Rio Grande Delta to the Yucatan Peninsula. The last comparable year for this survey was 1967.

Habitat and water conditions on the east coast were generally good, except in the Tamesi-Panuco Delta, where there appeared to be too much water and along the Yucatan coast where water levels were low. Oil pollution was evident near Tampico and in the vicinity of Minatitlan. Overall, waterfowl populations were 41 percent higher than in 1967 with ducks up 85 percent, geese up 68 percent, and coots up 9 percent.

CENTRAL INTERIOR HIGHLANDS

Data supplied by Flyway Biologist Rossalius C. Hanson and Assistant Supervisor Morton M. Smith, Bureau of Sport Fisheries and Wildlife

This survey covered the interior of Mexico from Juarez south and east to Mexico City. The last comparable year was 1965.

Conditions appeared to be below normal in the northern portion of the survey area, but were normal or better elsewhere. Overall, there was little change from 1965. Ducks were down 7 percent, coots down 8 percent, and geese down 17 percent.

WEST COAST

Data supplied by Flyway Biologists G. Hortin Jensen and K. Duane Norman, Bureau of Sport Fisheries and Wildlife

This area includes both coasts of Baja California and the mainland coast from Mexicali to Puerto Vallarta. The last comparable year was 1965, although surveys for black brant only have been completed every year.

Overall duck populations were down 44 percent, with all species except mergansers and scoters showing a decrease. Geese are normally present in such small numbers that no meaningful comparisons can be made. Coots were up 65 percent from 1965. Black brant were down 6 percent from 1969, but up 5 percent from the long-term average.

BREEDING GROUND SURVEYS

ALASKA AND YUKON TERRITORY

Data supplied by James G. King and Wesley Moholt,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions

All parts of Alaska enjoyed an extremely mild winter with very little snowfall. Estuarine wintering areas south of Anchorage had almost no subfreezing weather. In the principal nesting areas farther north, dry weather continued into winter and what moderate snowfall there was evaporated in late winter thus water levels are a good deal lower than last spring. Flooding, of course, was absent.

Unlimited dry nesting sites were available even before the thaw. Thawing began early enough so migrant birds could find plenty of open water and proceed with nesting undelayed.

Although a good many water areas dried up in the interior (stratum 38), I believe we were still within the range of normal fluctuations and were not having a drought of unusual proportions. The Yukon Flats habitat appeared to be very comparable to what it was in 1960 and 1961 when we enjoyed high population indexes.

Breeding populations (tables B-1 through B-3)

The 1970 population index for dabblers showed a considerable increase over last year and is the highest recorded except for 1968 when displaced prairie ducks seem to have come to Alaska in big numbers. Part of this increase may be due to favorable visibility occasioned by low water levels. There was no flooded cover of any sort and the margins of many lakes were unvegetated mud. Visibility would be very comparable to the 1960 and 1961 seasons.

Divers seem to have increased slightly except for lesser scaup in stratum 38 which showed a significant decline. This decline is masked somewhat by the fact that greater scaup in stratum 37, which are lumped with lessers, showed a moderate increase.

Puddle ducks showed general increases with mallards up 153 percent possibly due to extremely mild weather in coastal Alaska where many of them winter.

Whistling swan seem to be holding population levels very well and may be increasing somewhat. We are in process of a thorough review of the swan data. Indications are that we do not see 100 percent of them on survey as previously believed. The speculation that some Alaskan swans winter on the Atlantic coast was confirmed this year when a Yukon Delta banded bird was recovered in Georgia.

Summer weather and habitat conditions

After an extremely mild winter all over, spring came early to the waterfowl areas of southern and central Alaska and later than normal on the Arctic Slope. Most nesting occurred under favorable weather conditions but in mid-June, prior to most hatching, wet weather set in. In a State where mean annual precipitation runs from about four inches (Point Barrow) to 221 inches (Port Walter), "wet weather" means different things to different people. There was, however, unanimous agreement throughout Alaska that this was a wet summer.

Forest fires which were a nuisance in 1969 and may have burned up some nests were nonexistent in 1970.

Water levels in the lakes which continued to decline through the fall of 1969 and were not recharged by snow melt, rose slightly through late June and July. Water levels at Tetlin and Fort Yukon were almost identical with the previous year. At Fort Yukon, 27 percent of the lakes on the study area were still dry.

Production (table B-4)

Waterfowl production which had shown a steady increase since the low of 64-65 suffered a marked decline this year. In spite of a good increase in the duck breeding population index, both study areas showed a remarkably consistent decline. Ducks and geese may have fared better on the Yukon Delta but swans and other birds showed a decline there as well. Reports from the Arctic Slope indicated a sharp production decline from last year for swans and white-fronted geese as well as ducks.

Mallards which were up 153 percent in the breeding population appear to be down slightly. In spite of a 53 percent increase in the breeding population of widgeon, the study areas indicate about a 70 percent decline in broods. The story was much the same with green-winged teal which had an increase of 54 percent in the breeding population and a decline of about 40 percent in broods. Pintail with a smaller increase in breeding population indicated a slightly smaller decrease in production (-30 to 40 percent). The picture was not as clear for shoveler and canvasback but some decline was indicated. Lesser scaup showed a 32 percent decline in breeding population and an 80 to 90 percent decline in broods.

NORTHERN ALBERTA, NORTHEASTERN BRITISH COLUMBIA, AND NORTHWEST TERRITORIES

Data supplied by James F. Voelzer and G. Hortin Jensen,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions

Early winter was generally characterized by low precipitation and subnormal temperatures. Moderation ensued in February and continued generally through the succeeding months leading into the waterfowl season. Temperatures 16 degrees above normal were recorded in February and March, while April temperatures were 8 degrees above normal in the mainland sections. Only the north coast had below-normal temperatures in April. Precipitation was normal or below in the survey area, except along the south shore of Great Slave Lake. The eastern half of northern Alberta was deficient in precipitation during the early spring months. In April, precipitation was high in northern Alberta, and Hay River had 26 inches of snowfall. April precipitation was below normal around Yellowknife and north to Norman Wells.

May was characterized by periods of rainfall. Northeastern British Columbia and adjacent area was affected. The lower Mackenzie Valley experienced precipitation in late May and early June. At higher elevations, this turned to snow, and Inuvik and parts of stratum 10 showed evidence of recent snow during transect flights. The Franklin and Mackenzie Mountains were covered with several inches of new snow in early May.

In spite of this, we expect adverse conditions for breeding waterfowl only along the north coast and the Old Crow Flats. Larger lakes in northern Alberta were more free of ice than usual. Great Slave Lake was near the opening stage by mid-June. In June, unseasonably warm temperatures were recorded in the southern half of our survey area. Edmonton experienced temperatures in the low 90's, and temperatures were in the high 70's as far north as Yellowknife.

No impacted floe ice was observed in the Mackenzie River, and the main channels of the delta were open upon our arrival. Normally they are plugged with ice. The Old Crow Flats were delayed in spring opening. Low clouds and precipitation plagued the north coast during late May and June. Snow showers were a daily occurrence.

The general climate of the survey area was mild, and the country comprising the Mackenzie drainage emerged from winter earlier than usual. This allowed for penetration by waterfowl and a greater dispersion east and west from the main stem of migration down the Mackenzie River system. Thus, the stage was set to give conditions which would be favorable to the early nesting species; namely, prairie ducks.

Breeding populations (tables B-5 and B-6)

No significant departure in total waterfowl was noted from 1969, and total waterfowl decreased only 9 percent from the past 10-year average.

However, the data revealed a significant change among the species represented. Prairie ducks showed good increases across the board. Principal species, mallard, widgeon, and green-winged teal, increased 25, 35 and 48 percent, respectively. Among the divers, scaup increased 8 percent from last year. All diving ducks increased 5 percent over the total for last year. In 1970, scoters and oldsquaws decreased 30 percent.

Comparisons with average do not favor prairie ducks. Instead, they are 20 percent below the past 10-year average. Diving ducks are 4 percent above average and scoters, oldsquaws, and mergansers caused miscellaneous ducks also to be 20 percent below average.

There is an indication that prairie ducks moved farther north this season, and increases were evident in most strata. However, these increases must be placed in proper context. They were recorded against a rather significant decrease of prairie ducks in 1969.

Vagaries of sampling with regard to coots and geese make comments on these species mere conjecture--an art more than a science. An increase in Canada geese is expected. Coots may be showing a reaction similar to prairie ducks. White-fronted geese showed a decrease, but this is contrasted with excellent counting conditions in 1969 and the decrease may not be real. Swan distribute themselves more evenly over their breeding habitat and indices are more relevant. An increase of 23 percent from 1969, and an increase of 27 percent from average is indicated.

Summer weather and habitat conditions

Above normal temperatures and rainfall characterized the weather in the Edmonton and southern portions of the survey area for the month of June. However, north of a line extending generally from Fort Chipewyan to Fort Nelson, British Columbia, weather conditions were normal for production success. Abnormally high rainfall, including thunderstorms and hail persisted in the Edmonton vicinity through July and the effect of this adverse weather can be seen in the production figures for stratum 13 and 14.

Of particular interest is the effect of the W.A.C. Bennett Dam, in conjunction with a low water cycle, on the Athabaska Delta. As of August 1, the water level of the lake was approximately 8 feet below that of the traditional lake level. Many water areas that two years ago held three to six feet of water depth are now dry pastures.

The effect upon waterfowl production and migration is yet to be concluded, however, the fact that muskrat trapping was down 75 percent, water areas have disappeared, and vast mud flats have appeared (dare we mention botulism) do not encourage optimistic point of view unless water levels recover.

Habitat and weather conditions north of Lake Athabaska were normal with the exception of the Mackenzie River which was below normal level for the second consecutive year.

Production (tables B-7 and B-8)

Standard brood survey transects for the Northwest Territories and northern Alberta, as flown, are 1/4 mile (1/8 mile on each side of the aircraft) in width.

For the second consecutive year, brood transects were conducted in strata 13 and 14. Stratum 13 reflected a decrease of 60 percent from the 1969 index of 935,000 to 374,000 in 1970. Stratum 14 fared better with a decrease of only 8 percent from the 1969 figure of 318,000 to 292,000 ducklings in 1970.

Strata 06, 07, and 09 showed increases of 90 percent, 181 percent, and 199 percent respectively while the two northern portions, strata 10 and 11 decreased.

Including strata 13 and 14, there was a decrease of 291,4000 ducklings produced or minus 14 percent compared to 1969 in the Northwest Territories and northern Alberta. Less strata 13 and 14, there was an increase of 295,800 ducklings in the survey unit for a total index of 1,064,000.

The average brood size for the survey area was 5, equal to 1969. Sixteen percent of the broods were Class I, 43 percent Class II, 34 percent Class III, and 7 percent were unclassified.

NORTHERN SASKATCHEWAN, NORTHERN MANITOBA, AND SASKATCHEWAN RIVER DELTA

Data supplied by Arthur R. Brazda and Richard A. Gimby,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions

September and October of 1969 were characterized by extended periods of heavy rainfall and considerable heavy snow. The remainder of the fall-winter period was comparatively mild, with very little snowfall. Extreme cold periods were few in number and short in duration. As late winter melded into early spring, the area received a couple of heavy snowstorms, and from these developed the generally favorable habitat conditions encountered during the breeding pair survey. First indications were that it would be a late spring. When the survey was initiated, there was little or no vegetative development, except in west-central Saskatchewan. On May 26, all of the larger lakes in the Saskatchewan River Delta were still ice-covered. However, the last days of May and the first days of June experienced unseasonably warm temperatures in the mid-90's, and leaf development, especially in Saskatchewan, was almost complete within a few days. The high temperatures were accompanied by high winds and shallow water areas disappeared at a rapid rate. Immediately following the hot, dry weather, the northern portions of Alberta, Saskatchewan, and Manitoba reacted like a tinder box and forest fires broke out everywhere. On June 8, Alberta and Saskatchewan recorded 195 fires, some of which were of large magnitude. Actually, two flying days were lost because of poor visibility due to smoke.

Water levels in many of the larger lakes in the northwest quarter of Saskatchewan were still below normal, though the forest potholes and grassy marshes are in fair to good condition.

Breeding populations (tables B-9 and B-10)

Duck fortunes in these four northern Strata continue to prosper, if the 1970 breeding population survey was any indication. In the dabblers, the mallard and pintail indexes increased 24 percent and 55 percent, respectively, over 1969 and 99 percent and 143 percent over the 8-year average. For the first time since these surveys were initiated in the north, the mallard index exceeded the half-million mark. The American widgeon also showed a substantial increase, 48 percent over last year. Gadwall and green-winged teal indicated decreases of 46 percent and 3 percent from 1969, but only the gadwall decreased below the 8-year average, 7 percent. All dabblers increased 32 percent over the previous year and 93 percent over the average.

In the four major diver species, all had substantial increases over 1969 and over the 8-year average: redhead, 93 percent and 38 percent; canvasback, 282 percent and 50 percent; scaup, 32 percent and 70 percent; and ringneck, 47 percent and 63 percent.

Only in northern Manitoba (stratum 17) was there a measure of skepticism, and that was for the redhead and canvasback data. These

species were found in one relatively small area and definitely do not represent the distribution pattern throughout the remainder of the stratum. All divers increased 41 percent over 1969 and 71 percent over the 8-year average.

Canada geese decreased 70 percent from 1969 and 25 percent from the 8-year average. Habitat conditions for these so-called interior nesting geese appeared to be better than average and it was probably this abundance of habitat that made the geese more difficult to observe.

The coot index was 75 percent above the previous year, but 48 percent below the 8-year average. During the past 10 years, only in 1968 were a large number of coot observed.

Summer weather and habitat conditions

The last half of May and the first two weeks of June were relatively dry and hot, producing high record temperatures with a considerable number of forest fires throughout northern Saskatchewan and northern Manitoba. The second half of June was abnormally wet with record or near record amounts of rainfall and near normal temperatures. July was near normal in most respects, although rainfall was not lacking. Neither low temperatures nor extended periods of cold drizzle were experienced during these three months.

Under normal circumstances, a deterioration of habitat due to a lack of rainfall has occurred. Unfortunately, the quality of the production habitat decreased in 1970, also, but because of too much, rather than a lack of rain. Undoubtedly, considerable nest destruction occurred because of the high water. There is a distinct possibility that considerable nest loss took place late in the incubation period, and due to a lack of active drakes or continued flooding, the hens discontinued their nesting activities. This latter situation could also account for the low late-nesting index for some of the puddle ducks. The divers, being later nesting species generally, should have had a more active late-nesting index, but this was not true of the lesser scaup in 1970.

The Grand Rapids Hydro-Electric Project on the Saskatchewan River continues to raise havoc with waterfowl production in the eastern half of the Saskatchewan River Delta. In the spring of the year, the western part of the impoundment had a high breeding pair index. However, by early or mid-July, the majority of these nesting areas were completely inundated.

Production (tables B-11 and B-12)

The duck brood index was 14 percent below 1969 but 23 percent above the 9-year average. The average brood size was slightly above the previous year and slightly higher than the long-term average. The coot brood index was 117 percent above 1969 and 44 percent above the 9-year average.

Canada goose broods were observed only in stratum 36. Nine broods were recorded with 40 goslings. Two broods were observed in the same stratum in 1969.

NORTHERN AND WESTERN ONTARIO

Data supplied by Edward G. Wellein and Everett B. Chamberlain,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions (table B-14)

Spring was late in this survey area. Late snow storms were reported during May at the time when surveys were well under way in the prairie areas. While this may have had some effect on first nesting efforts, our observations indicated that nesting was well under way at the time of the survey, which was somewhat later than usual this year. (Survey dates in 1969 were May 25 through June 11. In 1970, the dates were June 4 through 10.) Vegetation was well along at the time of the survey, but the lateness of the season was evidenced by the fact that lilacs were just coming in bloom at Kenora when we left on June 12. In general, water conditions were good to excellent. Big Trout Lake was still about 90 percent ice-covered at the time of survey (June 6). This may be a normal situation for Big Trout, although it was essentially ice-free at the time of the survey last year.

Breeding populations (table B-13)

The total duck index shows essentially no change from 1969, increasing less than 1 percent, and about 4 percent from the 10-year average. There are, however, some rather sharp changes among species. Mallards were up 21 percent over 1969 and total dabbling ducks increased 20 percent. Black ducks were down 50 percent from 1969 and 51 percent from the 10-year average. Numbers of scaup were little changed from 1969 while ringnecks and buffleheads increased. Goldeneyes and mergansers showed marked decreases from 1969.

SOUTHERN ALBERTA

Data supplied by K. Duane Norman and R. David Purinton,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions

April was cool and sunny. The 20 inches of snow falling in Calgary were more than twice the normal for the month. May was generally cool and windy. About only one-third of the normal amount of precipitation fell during the month. At the beginning of the survey period, only a little snow remained in isolated areas in the Cypress Hills and near the mountains at the west end of the transects. Although a little ice was noted during the Canada goose survey on the Red Deer River near Heatburg, all other water areas were ice-free.

Habitat conditions can best be termed as poor in stratum 28 but as usual, water levels were good in the Milk River Ridge area. Water conditions did not materially improve until about 40 miles south of Calgary. Habitat conditions improved considerably above a line extending from Calgary to Drumheller to Empress. The area east of McGregor Lake and east of the Louisiana Lake complex was quite dry. Good conditions again existed northwest of Empress. Fair habitat was found in the Wintering Hills and it became good on the east slope of the Hand Hills and southeast of Hanna. Sounding Creek was very good as was the habitat eastward to the Saskatchewan border. All of the large lakes to the north including Sounding Lake, Sullivan Lake, Farrell Lake, Chain Lakes, Dowling Lake, Gough Lake, and Lowden Lake contained excellent water levels. Water extended far into the old vegetative cover in Grassy Island and Kirkpatrick Lakes. Little Hay Lake east of Hay Lakes contained water for the first time since 1965. Habitat north and east of Edmonton generally was not in as good a condition as in previous years since the more temporary areas had long since became dry. The total index indicated an increase of more than 14 percent from last year for the survey area with the greatest increase noted in stratum 27. Although the index is below the desired average in strata 26 and 28, the above average water index in stratum 27 brings the survey area index to 2 percent above average.

Breeding populations (tables B-15 through B-17)

Progress of nesting appeared to be about normal, although at the start of the survey, flocks of lone drakes totaling 60 to 80 were observed for mallards and pintails. Scaup were still present in large flocks and bluewings were not present in numbers as they usually are. Broods began to appear about halfway through the survey and were quite commonly observed after the survey was completed.

The total duck index showed an increase of 1 percent. Mallards showed the greatest increase from last year, 25 percent. The decrease in pintails was 8 percent. Substantial increase in indexes were indicated for widgeon, bluewings, canvasback, ringnecks, and ruddys. When making comparisons with the 1956-62 average, only the ringnecks indicated an increase. The total duck index was 25 percent below the average.

The coot index indicated a decrease of 13 percent from last year which can be attributed almost entirely to the loss in habitat in stratum 28. The coot index exceeded the average by 21 percent.

This year's lone drake index of 78 was the lowest since 1966, but only very slightly below average. The mallard index is below average and compared with the indexes recorded in 1955 and 1961. The pintail index was slightly less than last year but is slightly above average. The index for canvasback is below average and last year. The index for canvasback is below average and last year. Using the lone drake index and other observations, this year's nesting season was a normal or average season.

Summer weather and habitat conditions (table B-14)

Average temperatures at Calgary and Edmonton during June were five to seven degrees above normal making this June the warmest in nine years and the second highest in 90 years. Above average temperatures were recorded on 18 days with record breaking maximums being recorded on the 2nd through the 4th. Extremes were also recorded in rainfall. Calgary received almost twice the normal precipitation. Precipitation in Edmonton was 13 percent above normal. Thunderstorms with varying amounts of hail were reported throughout the month in southern Alberta.

July in Calgary was sunny and warm with only a trace of rain being recorded, but in Edmonton on the 9th, nearly 2 inches of rain fell in less than an hour paralyzing the city.

The average amount of rainfall normally received during the month had already been recorded by the 12th. Thunderstorms and hail were common. The town of Viking was severely damaged during this period and was declared a disaster area. There can be no doubt of the outcome of broods and other ducks caught in the path of these storms.

The July pond index showed an increase of 22 percent from last year. An increase of 42 percent was indicated in stratum 27 but decreases of 6 percent and 7 percent are indicated in strata 26 and 28, respectively. Since the time of the May survey, pond numbers decreased 39 percent in stratum 28, 50 percent in stratum 26 and 33 percent in stratum 27. Pond numbers in the entire survey area decreased 38 percent since May. Pond numbers for July were above the average only in stratum 27. They were slightly below average in stratum 26, but were well below average in stratum 28.

In stratum 28, little change in habitat was apparent since the May survey. The stratum 26 potholes in general can best be termed as fair habitat. In the northern portion of the stratum, aquatic vegetation commonly occupies up to 70 percent of the water surface especially in the type III wetlands making it extremely difficult to see birds that may be present. Generally, waterfowl habitat conditions are good to excellent throughout stratum 27. As in stratum 26, the major lakes contained excellent water levels and most certainly contained good water levels throughout the fall migration period.

Production (tables B-18 and B-19)

As during the breeding pair survey, most factors observed during July indicated a normal or perhaps slightly early nesting season. Before the pair survey was completed during May, broods were commonly observed. We believe that it was entirely possible that a high percentage of the mallards, pintails, and other early nesters had broods on the wing which could not be counted, thus partially accounting for the 38 percent decrease in the duck brood index from last year. In comparing the averages, the brood index was 65 percent below the 1956-62 period.

Throughout the survey area, especially north of Drumheller, groups of mixed sexes of mallards and pintails were observed which were

normal from April 1 on. Several spots had as much as four to six inches above normal. The pond index in this report was 1,764,800, or 82 percent above last year. All strata were above last year (a good year). Water conditions were better than any year since 1955.

A few dry spots were noted in strata 23, 19, and 22. Continued showers and thunderstorms throughout the period replenished ponds. We heard complaints from farmers that there was too much moisture, which is quite unusual for this time of year.

The vegetation was heavy in the water areas. White top was abundant and made visibility a real problem in sighting broods and adults. No lack of nesting cover or habitat was in evidence in most areas. Hail and wind damage was reported in some areas in July but could not be considered to have any important effect on nesting success. Some losses could have resulted from flooding. However, no evidence was forthcoming that any appreciable damage to nesting was experienced. It could be said that good to excellent nesting conditions prevailed after late May.

Farm grain crops were one week to ten days behind normal. Reports from some areas indicated inability to plant grain crops because of wet fields and sheet water. Forage crops were excellent and yields from grain crops were expected to be heavy because of more than ample soil moisture.

Production (tables B-25 and B-26)

This was one of those tough years to get a reading on production. Heavy vegetation made broods difficult to see. A late spring retarded the early broods. Inclement weather--snows, rain, and cool weather--in late April and early May apparently caused damage to early nesters that were laying but not incubating, as reflected by small brood sizes and scarcity of early broods in eastern sections. Western sections of the Province had successful early nesters. Water conditions and a sizeable late-nesting index pointed toward a strong late nesting effort.

The brood index was 137,500, or 30 percent below last year. Brood size was 9 percent under last year. The brood index was better than any year (except 1969) back to 1958. Ducklings in the brood were 9 percent above the long-term average.

Coot broods showed a 26 percent increase over last year. They remained below the long-term average but from favorable ground reports, it appeared that coots would be in abundance this fall.

As we mentioned, early nesting success in western areas was good. Farther east, it was fair and in the far east, it was poor. From the reports and best information we could get, it looked like pintails suffered the most. They came out all right in the west with practically a "bust" in the east. Mallards appeared to follow this same pattern, but persistent renesting efforts should have put them in better shape than pintails. Canvasback broods of all classes were reported from a variety of areas. They did well despite adversity. The gadwalls, baldpates, teal, redheads, and such should have had no problems.

obviously flying broods. However, they were not tallied since in no way could one be certain that they were indeed broods and not adults. Other flocks of ducks largely mallards, pintails, and gadwall numbering 100 to 200 birds were commonly observed.

An analysis of the brood composition also tends to indicate a progressed nesting season. Class I broods comprised only 23 percent of the total number of broods. Class II broods comprised 35 percent, and Class III broods comprised 27 percent.

The brood index decreased 50 percent in stratum 28, 23 percent in stratum 26, and 45 percent in stratum 27. From our observations during the survey, we had anticipated a considerably smaller brood size than was recorded since many single, two and three-bird broods were observed.

The coot brood index was slightly less than last year and 72 percent below the average. The number of broods remained the same as last year in stratum 28, but decreased 19 percent in stratum 26 and 4 percent in stratum 27.

Late-nesting indexes showed a significant increase in both dabblers and divers from last year and the average. Greatest increases were noted in mallards and gadwall. Only pintail and canvasback indicated decreases in the late-nesting index. The survey area late-nesting index indicated the availability of nesting habitat. The index in stratum 28 decreased from last year and that in stratum 26 remained about the same, but the index in stratum 27 where good habitat can be found, increased markedly.

SOUTHERN SASKATCHEWAN

Data supplied by Rossalius C. Hanson and Everett B. Chamberlain, Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions (table B-20)

Total ponds this spring, 2,776,300, were up over last year (a good year) by a whopping 49 percent. The increases were in all strata. Only 21 showed a minimal gain of 8 percent. Ponds were above the 1956-62 average by 87 percent. We expected to find a few poor spots, and we did. These were isolated and not of too great a magnitude. Some dry areas were found in the extreme southwestern part of stratum 23, around Leader in stratum 19, and in the northeastern part of stratum 22. Water quality was generally good throughout the area.

All this water came about through a wet fall, near normal snowfall throughout the general area, and late heavy snow storms in late April and early May. May was a wet month except for areas north of Saskatoon. However, even in stratum 21 water conditions were still quite good with flooding conditions and high water in the Duck Lake area.

After the two to five inch snow on May 10 and 11, back roads were almost impassable, slowing down our ground crews. Snow drifts from this storm and the late April storm, which covered an area from Swift Current east to the Manitoba line and north to Saskatoon and Melfort, lasted well past the middle of May.

The spring was late and probably behind normal by ten days to two weeks. Vegetation was slow growing in the potholes. We found sufficient last year's growth and little, if any, burning. It was felt that nesting habitat was adequate even with the late start for spring vegetation. Surprising to us was the progress of the season north of Saskatoon. Much of this area was ahead of the areas along the border. Once the cold, wet weather let up along about the third week in May, the spring caught up. Leaves sprang out almost overnight, and things began to grow.

Spring field planting was late, and by mid-May only areas in the west and southwest had seeds in. Most of the east, central, and northeast had not even started. As late as May 26, there were many of these areas still to be planted.

This year I saw more grain overwintered in the swathes than any time in the past ten years. Most of this was in the north-central and northeast portions of the parklands.

Breeding populations (tables B-21 through B-23)

Our population index this year stood at over 3 million ducks. This is the highest population since 1958 and is 18 percent above last year. It is only 10 percent below the 1956-62 average. After a good production season last year, the local birds came back home to nest. There was an increase in puddle ducks in general except for gadwall and baldpate. These two species were down about 20 percent from last year. Mallards were up 25 percent and pintails up 36 percent from last year.

Redheads and canvasbacks showed increases of 53 percent and 62 percent, respectively, over last year. Scaup decreased 20 percent. Coot numbers were unchanged from last year.

Although populations were generally still below the 1956-62 average, this difference was relatively small except for a few species. For instance, total ducks were down only 10 percent from the average and puddle ducks only 6 percent. The more important ducks still down were mallards (34 percent), redheads (18 percent), scaup (56 percent), and bluewings (10 percent).

The mallard, pintail, canvasback lone drake index was 80 percent, a definite indicator of a late spring and a retarded nesting season.

Summer weather and habitat conditions (table B-24)

Our favorable reports in May, June, and mid-July on water and habitat conditions still held up throughout the period. Precipitation data from numerous reporting points in southern Saskatchewan showed moisture accumulations generally were from one to three inches above

The late-nesting index was the largest on record back to 1958. Previous to that date, southern Saskatchewan's late-nesting index figures were based on a different formula; therefore, at present they cannot be considered comparable.

SOUTHERN MANITOBA

Data supplied by Donald N. Frickie and Morton M. Smith,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions (table B-27)

The fall of 1969 was mild and wet in southern Manitoba. The winter of 1969-70 was relatively dry with normal temperatures until late winter and early spring which were cold and wet. The last half of April and the month of May were very wet in southern Manitoba. A snowstorm on May 11 deposited five to seven inches of wet snow across the entire southern half of the survey unit. As of May 28, the 1970 growing season precipitation (that since April 1) from ten stations scattered through the survey unit was 86 percent above normal. May 1970 was characterized by cold cloudy weather. From April 1 through May 28, mean temperatures for the survey unit were 2 to 5 degrees below normal. May was a raw, miserable month in southern Manitoba. This season was a late one for waterfowl in southern Manitoba. When we arrived on May 5, most of the lakes in the Turtle Mountains were ice-covered. Whitewater Lake and Oak Lake were about 25 percent ice-covered, and all the lakes on the southern slope of the Riding Mountains were still frozen. On May 11, ponds in the Minnedosa area were still frozen on the bottom and no aquatic emergent vegetation was noted during ground work there. May 18 brought the first definite signs of leafing on aspen. The phenology this May was ten days to two weeks behind that of 1969.

Agricultural operations were very late in Manitoba this year. During the first half of May, no farmers were seen plowing fields and very little burning was noted. Because of flooding and continued rain, some lowland areas will not be worked at all in 1970. Swathed grain from last year still remained in some areas, and a few fields from 1969 were still uncut this May. As of May 28, it was reported only 5 percent of the Manitoba grain areas had been seeded.

There are many ponds in southern Manitoba and water levels were high. The May 1970 pond count was 74 percent higher than 1969 (a good year) and 26 percent higher than the 1956-62 average. The wet fall and spring hindered the usual clearing and burning operations and upland cover was good. Although overwater cover appeared flooded and sparse in some areas, it was adequate.

Breeding populations (tables B-28 through B-30)

Breeding duck numbers in southern Manitoba in May 1970 were 17 percent higher than the 1969 counts but still 25 percent below the 1956-62 average. The important mallard was up 19 percent over 1969, yet remained 47 percent below the 1956-62 average. Blue-winged teal numbers were up substantially compared to 1969 and pintails increased slightly. Aerial counts for both of these species were the highest since the 1960-61 period. The 1970 aerial indexes showed an increase in redheads and a decrease in canvasbacks when compared to the 1969 figures.

Coot numbers increased greatly in both stratum 24 and 25 resulting in a 70 percent increase in coots in 1970 over 1969.

The lone drake index is considered an indicator of the progress and intensity of the nesting effort. The 1970 lone drake index was lower than that of 1969 and agreed with our observation that the nesting effort this spring was delayed. Ground studies by Jerome Stoudt in southern Manitoba supported the view that duck nesting in 1970 was later than in 1969.

Summer weather and habitat conditions (table B-27)

The habitat was sampled during the May breeding pair survey, in the late June water survey, and in July during the production survey. The July 1970 pond count was 20 percent above the 1969 count and 4 percent below the 1956-62 average for southern Manitoba. There was excellent brood water in Manitoba this summer. Overwater vegetation was sparse in May but many ponds are now grown through with emergents and aquatics. We believe "brood visibility" was below average this July due to heavy vegetation and increased water levels. Crops were late this season in Manitoba and some fields were not worked at all. Because of new Federal agricultural programs, there was a reduction in the acreage of wheat planted this year. It appeared grain production per acre will be good this year in southern Manitoba. There was an increase in sweet clover, flax, and rape this season and a substantial acreage remained in stubble or summer fallow as a result of the Federal LIFT Program.

Production (tables B-31 and B-32)

The 1970 brood index for southern Manitoba was 7 percent below the 1969 figure. The 1970 average brood size was average for the area but smaller than last season's. The 1970 coot brood index is 15 percent lower than that of 1969 but 62 percent higher than the 1956-62 average.

The 1970 index to late nesting, which is the "measure of broods to come," was 5 percent below 1969 and 21 percent below the 1956-62 average. This was surprising since 1970 was a late nesting season in southern Manitoba. In late wet years, we expect a substantial late nesting effort. We saw little evidence of such a late effort in southern Manitoba this July.

Data supplied by Alva E. Weinrich and Thomas J. Harper,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions (table B-33)

Special weather summaries for the months of January through May by the ESSA-Weather Bureau State Climatologist for Montana reported above normal precipitation generally for the survey area. Rangelands looked good throughout the survey area with the exception of the area north and east of Havre. The big marsh in segment 16, transect 11, was completely dry this year--the first time since this survey initiated. Agricultural activities were hampered by a cold, wet, late spring with many ranchers caught without a crop sown at the end of May which is almost too late.

Phenologically, the waterfowl breeding conditions were about one week later than normal as was the actual survey because of adverse weather. Generally, stratum 40 was much wetter and stratum 41 much drier with the Missouri River as the boundary. Many of the grass-covered spillways on stock dams showed signs of heavy cutting out and erosion. The area water indexes were up slightly from last year and up 33 percent from average. The stock dam, pothole, and streams indexes were up in stratum 40 and down in stratum 41.

Breeding populations (tables B-34 through B-36)

There was no change in the total duck index from last year; however, it remained 10 percent below average. A decline in all divers was noted as well as in gadwall, blue-winged teal, and shoveler from last year. Mallards showed an 11 percent gain and pintails a 35 percent gain over last year; however, both were below average. Scaup and canvasback showed an increase above the average but fell below last year's indexes.

Summer weather and habitat conditions (table B-33)

During the month of June and particularly in the first two weeks of July, precipitation was below normal and water areas dried up. Once it warmed up, crop and rangeland growth was accelerated so that by July 1 growth rates were only slightly below normal, but rains were needed. In mid-July, varying amounts of rain up to two inches fell across the survey area assuring continued habitat growth and raising of broods. Several storms with winds of 40 to 60 miles per hour passed through the area in July. Vegetation in the shallower potholes and around the edges of stock dams was quite heavy this year and had some effect on visibility of broods. Stratum 40 habitat south of the Missouri River was in much better condition than stratum 41 north of the river. The July water index was down 25 percent from 1969 and was 3 percent above average.

Production (tables B-37 and B-38)

This year's unadjusted breeding pair survey data indicated no change from last year in Montana. The production data indicated a decrease of 31 percent in the duck brood index from last year. Average brood size was up slightly. The class composition of the broods were Class II - 41 percent, Class III - 38 percent, and Class I - 21 percent this year. Only one of the Class III broods was observed to be flying. Twenty seven percent of the broods observed this year were in stratum 40 and 73 percent in stratum 41, which was about the same distribution as last year.

NORTH AND SOUTH DAKOTA

Data supplied by Gerald Pospichal and Edward G. Wellein,
Bureau of Sport Fisheries and Wildlife

Spring weather and habitat conditions (tables B-39 and B-40)

The winter of 1969-70 was one of near-normal temperatures in the Dakotas. Snow cover was relatively light except for the western parts of both States. By late March, most of the snow had disappeared over the eastern two-thirds of both States and it looked like an early break-up with a dry spring. Beginning in mid-April, a series of weather systems moved through the Dakotas with rain and wet snows that turned April into the "wettest of the century in North Dakota." Floods threatened the Minot area, parts of the Red River Valley, and scattered communities throughout the State. Heavy rains continued throughout May and into June changing the water picture completely in North Dakota and with improvements to the north-central and eastern parts of South Dakota.

May water indexes for South Dakota were 26 percent below 1969 but were 36 percent above the 1960-69 average. Strata 32 and 33 showed declines in the number of May ponds, while stratum 34 showed a slight increase. Scattered areas of good water in 32 and 33 were noted in the Leola Hills, Waubay Hills, along the North Dakota-South Dakota border, and through an area running south and west of Aberdeen. The southeast and southern parts of the State held poor water levels. North Dakota had the highest May water index recorded since 1960, 18 percent above 1969 and 94 percent above the 1960-69 average. Stratum 29, the Red River Valley, showed a slight decrease over 1969 but 30 and 31 showed substantial increases over 1969 and the 1960-69 yearly totals.

Most of the farming operations were delayed two to three weeks in parts of North Dakota and were not completed in some on June 5 due to the wet spring. Trees leafed out early but caused no special problem in aerial observations. Pond vegetation was also advanced and was beginning to hinder observations toward the end of the survey.

Breeding populations (tables B-44 through B-46)

The 10-year trend in breeding population indexes by species for North Dakota, 1970, showed the highest population since 1960. North Dakota total ducks were up 25 percent over 1969 and 88 percent above the 10-year average. Coots were up 39 percent from 1969 and 19 percent from the average. As compared to 1969, mallards were up 48 percent, green-winged teal down 32 percent, shoveler down 2 percent, and pintails up 101 percent. Canvasback, redheads, and scaup showed drops of 51 percent, 11 percent, and 11 percent while ruddy ducks showed an increase of 53 percent.

The comparative status of populations in South Dakota showed decreases from 1969 in mallards 6 percent, gadwall 19 percent, blue-winged teal 19 percent, and shoveler 9 percent but increases in green-winged teal 406 percent and pintail 45 percent. Redhead and canvasback showed declines of 36 and 62 percent from 1969 but scaup and ruddy ducks showed increases of 469 percent and 405 percent. Coots remained about the same. All ducks and coots were up from the 1960-69 average: mallard 20 percent, blue-winged teal 3 percent, pintail 90 percent, redhead 3 percent, canvasback 18 percent, ruddy 435 percent, and coot 24 percent.

Summer weather and habitat conditions (tables B-39 and B-40)

In June and early July, water levels over most of North Dakota dropped alarmingly with the lack of rain, above-normal temperatures, and high winds. Small grain crops suffered as moisture became critical. Although the total number of ponds dropped considerably, 23 percent from 1969, it was still slightly above the average of 1966-69. Pond distribution was good in most areas and levels should have been adequate for broods and the late nesters. The water index for South Dakota declined 36 percent from 1969 and 25 percent from the 1966-69 average. The Leola Hills, Waubay Hills, and areas north of Mitchell and southwest of Aberdeen held good water levels. The south parts of strata 32 and 33 showed the greatest loss of potholes.

Pothole vegetation was extremely dense this year and hindered aerial observations.

Production (tables B-47 and B-48)

The July production survey indicated a 9 percent increase in duck broods over 1969 and an 18 percent increase over the 1966-69 average in North Dakota. The duck brood index in South Dakota was 7 percent below 1969 but 32 percent above the 1966-69 average.

In North Dakota, 15 percent of the broods were in Class I, 52 percent in Class II, and 33 percent in Class III while in South Dakota 24 percent were in Class I, 63 percent in Class II, and 13 percent in Class III. No broods were observed in either North or South Dakota during the May breeding population survey. Considering the July survey dates, it appeared that the early nesting efforts were quite successful. In many areas, congregations of ducks were present that appeared

to be flying broods, however, these were not counted as such. Likewise, heavy vegetation in the potholes this year made observations difficult. We feel the data quoted above are conservative and the actual production was better than indicated. Although coot broods in South Dakota declined 39 percent from 1969 and 8 percent from the 1966-69 average, in North Dakota there were brood increases of 31 percent over 1969 and 29 percent over the 1966-69 average.

MINNESOTA

Data supplied by Robert L. Jessen,
Minnesota Department of Conservation

Weather and habitat conditions

A relatively dry fall in 1969 was followed by heavy early winter snows. These early snows prevented deep frost penetration. The remainder of the winter had light snowfalls and spring snow melts did not provide much runoff. The result of this was a reduced number of spring ponds and lower water levels in others. The pond index for the survey strata in 1970 was 167,000, a reduction of 23 percent from the 217,000 pond index of 1969. Plant phenology and flight conditions were both considered normal.

Breeding populations (tables B-49 and B-50)

Statewide, the number of breeding ducks when corrected for birds not seen declined slightly (-5 percent); mallards increased (+22 percent); blue-winged teal remained the same (+1 percent); and ring-necked ducks declined slightly (-7 percent).

The prairie dabbling ducks, such as pintail and shoveler, showed marked declines. These were likely, at least in part, related to the reduced number of temporary ponds available.

Numbers of coot in the State increased slightly. They were less abundant on smaller marshes and, similarly, were conspicious on the larger, more permanent water areas.

The statewide breeding population, exclusive of noncensused lands, is estimated at 350,000 birds. Blue-winged teal are the most numerous (164,000), mallards second in abundance (123,000), and ring-necked ducks probably forth in abundance. The wood duck, which does not lend itself to aerial census, is judged to be third in abundance, but a reliable numerical estimate cannot be made for these birds.

CHIPPEWA NATIONAL FOREST, MINNESOTA

Data supplied by Jay Janecek, Robert Chesness, and Robert Greig, Minnesota Conservation Department, John Mathisen and Kirby, U.S. Forest Service, and Lewis Cowardin, Terry Clodfelter, Joseph Hopkins, and Harry Pinkham, Bureau of Sport Fisheries and Wildlife

Habitat conditions

The water level at the Winnibigoshish Dam on July 7, 1970, was on the low side of the normal or desirable summer range. Submerged and emergent vegetation was about the same as the past two years and the wild rice growth appeared to be good to excellent in most areas.

Breeding populations and production (tables B-51 and B-52)

The six main species of breeding ducks on the Chippewa National Forest area have been the mallard, widgeon, goldeneye, blue-winged teal, ring-necked duck, and wood duck. Other ducks include merganser, redhead, scaup, and green-winged teal. This year's waterfowl survey indicated a 43 percent decrease in the total number of observed and calculated ducks as compared with the par year of 1939-40.

WASHINGTON

Data supplied by Robert G. Jeffrey and Ellis L. Bowhay, Washington Department of Game

Weather and habitat conditions

Pothole numbers on transects counted in May were down 10 percent from the excellent conditions of 1969, but there was still adequate water. This, coupled with improved cover and food, provided the proper setting for outstanding duck production. Water levels in central Washington pothole areas and in some of the western Washington habitat suffered from a hot, dry summer. The drying did not appear serious enough to affect brood survival measurably.

Breeding populations (table B-53)

In 1970, there were 228,000 adult ducks on the breeding grounds of Washington, an increase of 52 percent over 1969. Major increases were

made by diving species, teal, and widgeon. The mallard remained the most numerous species on the breeding grounds, increasing by one-third to an index of 60,000.

Production (table B-54)

The State production index for all ducks was 729,600, up 71 percent from that of 1969, and the highest ever recorded in Washington. Young ducks made up 69 percent of the index, as compared with 65 percent in 1969 and 61 percent in 1968.

The potholes contributed most of the increase in ducks, but habitat within the forested areas of northeastern Washington produced well. Irrigated lands remained static in duck production, while western Washington habitat had fewer ducks.

Mallards increased by a healthy 42 percent, but lost ground to other duck species. The 165,000 mallard index made up only 23 percent of the duck total, as compared with 27 percent in 1969.

The production index for the Canada goose was 10,784, representing a slight increase over that of 1969. Building populations in a number of areas offset lower nesting success, and losses from predation and hydroelectric construction activity.

OREGON

Data supplied by Chester Kebbe,
Oregon State Game Commission

Weather and habitat conditions

The good water conditions of 1969 which filled many of the lakes, marshes, and reservoirs of southeastern Oregon, the area of major waterfowl production, continued through the spring and summer of 1970 and created better than normal breeding habitat. Average winter precipitation, followed by a cool spring, stabilized water levels and left the breeding grounds with an ample water supply.

Production (tables B-55 and B-56)

Canada goose production surveys were conducted on 18 ground samples, transecting all of the major breeding grounds in Oregon. Results indicated a slight increase from 1969 in the number of young produced with numbers identical with the average of the previous five years. Greatest increases were recorded in the restored water areas of Lake and Harney Counties while a slight decline was noted in the Klamath Basin.

Duck production continued to decline on established trend routes but this trend may be due to sampling errors rather than an actual statewide decrease. With improved water conditions throughout the State, the birds dispersed from established ground transects along permanent water areas to restored ponds and marshes. Results obtained on 16 transects, sampling 119 square miles of habitat, indicated a decline of 11 percent in duck production from 1969 and a decline of 22 percent from the previous 5-year average. Dabblers, which are the first to disperse to shallow marshes, showed a decline of 74 percent while divers are up 79 percent.

Despite an indicated decline in duck production on permanent samples, preliminary reports from Malheur Refuge, the major production area in the State, indicated an increase in duck production of roughly 30 percent. After a period of drought, water has returned to the Refuge in the last two years and restored much of the highly productive marsh. Early reports indicated a production index of 30,400 ducks as compared with 23,200 in 1969. The dabbler index was up from 17,200 to 20,100 while divers are up from 6,000 to 10,300.

IDAHO

Data supplied by Elmer R. Norberg,
Idaho Fish and Game Department

Weather and habitat conditions

A heavy snow pack in the mountainous portion of Idaho accompanied by a fairly late runoff created excellent water conditions during the 1970 early spring period. In addition, above normal rainfall created optimum production conditions for waterfowl. In southeastern Idaho, however, flooding of goose nesting areas did take place due mostly to releases of large amounts of water from reservoirs after nesting had started.

Breeding populations (table B-57)

The Canada goose breeding population in southwestern Idaho was down in 1970 both from 1969 and the long-term average. This was also true for portions of southeastern Idaho. Some increases were noted particularly in the Mud Lake-Camas National Wildlife Refuge area. The overall trend based on available data is down.

Production (table B-58)

In southwestern Idaho, Canada goose nesting success was excellent as compared to past years. The number of nests observed and the number of

successful nesting attempts were up 23 percent and 39 percent respectively. As a result, gosling production was up 46 percent over the past year and 8 percent over the long-term average.

In southeastern Idaho, however, Canada goose production was down drastically, due largely to the untimely release of water from reservoirs in that area. Blackfoot Reservoir was the only count area where production approached that of previous years.

Based on the available information, duck production has been excellent in southern Idaho due to good water conditions, which are continuing to the present time.

CALIFORNIA

Data supplied by J. R. LeDonne, F. M. Kozlik,
Harry George, and H. McKinnie,
California Department of Fish and Game

Weather and habitat conditions

The months of February and March were mild and wintering populations of waterfowl left the State on schedule with most of the birds leaving the Central Valley by the first part of April.

Water and habitat conditions in northeastern California were good this year and were similar to the excellent conditions of 1969. Almost all of the permanent water impoundments and marshes were full from runoff. In addition, many swales and low-lying meadows were full water to produce birds. The spring was mild and Canada goose nesting occurred at the normal period.

The Central Valley received above normal amounts of rainfall, although more important to production is the weather and rain during a given period which affects farming operations. This area is mostly composed of artificial and regulated water impoundments such as rice fields, grasslands, and pasture areas. Rice planting occurred at the normal time; however, the cool weather in late spring and early summer delayed vegetation growth by one to two weeks.

Most of the waterfowl production occurring in California is found in northeastern California and on the rice lands of the Sacramento Valley. Other areas covered by this survey are: Suisun Marsh, the Grassland, and rice and pasture areas of the Central San Joaquin Valley. Other smaller areas produce some ducks, but the accumulated total is of little significance during years of normal rainfall and runoff.

Breeding populations and production (tables B-59 and B-60)

The breeding ground survey for 1970 was conducted in essentially the same manner as in previous years, consisting of complete aerial

coverage of the "Great Basin" section in northeastern California and aerial transects in the Sacramento Valley, San Joaquin Valley and Bay area. On the Klamath Basin National Wildlife Refuge, ground counts were made by refuge personnel and supplemented with aerial survey work.

Nesting pairs of Canada geese increased 8 percent, while a 21 percent increase in the fall population was noted. Ducks showed an increase of 16 percent in nesting pairs and a 17 percent increase in the fall population index. Nesting pairs and fall population of coots were up over 100 percent.

UTAH

Data supplied by John E. Nagel,
Utah Division of Fish and Game

Weather and habitat conditions

The winter of 1969-70 provided Utah with average amounts of precipitation. Spring runoffs created excellent nesting conditions for waterfowl throughout the State. Managed marsh areas were in above average condition when breeding waterfowl returned this spring. Natural marsh areas around the Great Salt Lake and wetland areas in eastern and southern Utah were enhanced by ample runoff. Wetland habitat throughout the State remained in excellent condition throughout the spring and early summer.

Continued periods of rain through the end of June had placed little demand on waters stored in irrigation reservoirs. This has resulted in sustained water flows into managed marsh areas in northern Utah and slower than average deterioration of natural marsh areas. Average amounts of precipitation during the summer should have assured that wetland habitat remained in excellent condition throughout the summer and into the fall migration period.

Breeding populations and production (tables B-61 through B-64)

Aerial surveys indicated a substantial increase in breeding ducks on northern Utah trend areas. Ground counts on managed marsh areas also reflect an increase in breeding birds from 1969 levels. Better habitat conditions throughout the State and especially in areas immediately adjacent to developed marsh areas accounted for significant increases in the number of birds utilizing these areas and in the amount of habitat available to breeding waterfowl. This is essentially the same type of situation experienced in both 1967, 1968, and 1969.

Breeding populations of mallards, ruddy ducks, and shovelers on major census areas can be considered as normal. Redheads and gadwalls

increased from 1969 levels for the second consecutive year. No major shift in species composition between northern and southern breeding areas was noted.

Brood counts are made on several trend areas in Utah to determine the relative status of Canada geese from year to year. Both ground and aerial surveys are conducted depending upon accessibility of the area. Canada goose brood counts indicated below average production of Great Basin Canada geese throughout the State. Major production areas in northern Utah showed a decrease in numbers of both breeding pair and goslings. Production areas throughout southern and eastern portions of the State exhibited the same downward trend. Bear River Migratory Bird Refuge was the only major breeding area to show an increase in production figures over 1968 levels. Breeding pairs of geese remained at 1969 levels and the number of goslings produced increased slightly in comparison to the previous year. Both figures were well below the average for either breeding pair or gosling production.

WYOMING

Data supplied by George Wrakestraw,
Wyoming Game and Fish Commission

Weather and habitat conditions

Weather and habitat varied greatly throughout Wyoming. Spring was late in arriving in western Wyoming and early nesting species were limited to restricted areas because of snow cover. Elsewhere, spring storms were frequent and abundant. Water was plentiful in most of Wyoming, with the exception of about 5,000 square miles of medium to high value habitat in Johnson, Natrona, and Converse Counties. This area was drier than at any time surveys have been made. Water remained in those areas where it was found in May and brood survival appeared assured. Flooding occurred along most of the major river systems in early June and some waterfowl losses did occur.

Breeding populations (tables B-65 and B-66)

The estimated duck breeding pair population for 1970 showed an increase of 34 percent from 1969 and an increase of 90 percent over the long-term average. A significant decrease in paired mallards and goldeneye was registered. On the other hand, tremendous increases were recorded for teal, widgeon, and gadwall.

Grouped birds observed during the survey were added to the pairs observed to arrive at a total duck figure by species. Overall, we recorded an increase of 44 percent from 1969 and an increase of 82

percent from the 1955-69 average. Mallards were also in short supply in this category. Mergansers continued to show a decline from previous years and coots are considered to register little change from 1969; they are up from the average.

An increase of 13 percent was found in the total number of geese on the survey areas over 1969. This number of geese also represented a 98 percent increase from the long-term average. Paired geese were found in fewer numbers this year and were down about 6 percent from the 1969 survey.

Production

Goose production was down somewhat on localized areas of the Green and Bear Rivers. Mallards were significantly below the 1969 population level. It was concluded that the fall flight of ducks from Wyoming will be significantly greater than in 1969 and far above average, except for mallards. Canada goose numbers are being maintained at a fairly high level and the fall flight of this species will be above 1969 and above average.

COLORADO

Data supplied by Michael R. Szymczak,
Colorado Division of Game, Fish and Parks

Weather and habitat conditions

Weather and water conditions for waterfowl nesting were somewhat variable through the major breeding areas in the State. A heavy winter snow pack, late spring snows, and a retarded runoff were factors affecting all major waterfowl breeding areas except San Luis Valley. Water was extremely plentiful in the east and central portions of the San Luis Valley but below normal throughout most of the west side of the Valley. In North Park, all river bottom areas were flooded, but water was not well distributed throughout the Park because of late runoff. Conditions for duck nesting in the South Platte and Yampa Valleys and Brown's Park were similar to those that existed the previous year. Far fewer water areas were present during the 1970 survey in the Cache la Poudre Valley than during the 1969 survey.

Breeding populations and production (tables B-67 and B-68)

The total number of breeding duck pairs on Colorado's major production areas declined approximately 17 percent from the 1969 level. Major reductions were noted in North Park and the Cache la Poudre

Valley. All other areas remained fairly stable with the San Luis Valley breeding pairs numbering approximately 27,000 for the third straight year.

The mallard continued to be the major breeding species in Colorado. Significant changes from 1969 totals were noted in the number of gadwall and green-winged teal. Gadwall were more numerous than in 1969 in five of six production areas. Large concentrations of gadwalls were found at some locations indicating that many of the birds could be migrants moving through Colorado. Air:ground comparison surveys in the San Luis Valley indicated that aerial observers recorded a remarkably high percent of the total green-winged teal present during the 1970 survey. The application of this visibility ratio to green-winged teal observed in North Park resulted in a reduced recorded breeding population of the species in comparison to the large numbers recorded in North Park the previous year.

Unusual water conditions along the Yampa River in northwest Colorado hampered both the production of Canada geese along the river and attempts to determine the results of the nesting season. Early in the nesting season, the water receded to low levels, providing easy access for mammalian predators to nests located on what normally would have been islands. Many nests were found destroyed during a mid-April survey. During the late May survey, high water completely inundated most islands from Craig to Juniper Springs making the search for nests impossible. Therefore, number of nesting pairs and total goslings recorded is quite possibly an underestimate for the Yampa River.

The number of birds observed on the Yampa River in 1970 increased by 140 in comparison to the 1969 total. The total number on the Green and Little Snake Rivers declined about 25 percent. Overall, an increase was recorded in the total number of adults in the survey area, but lower production estimates resulted in a total population similar in size to that of 1969.

NEBRASKA

Data supplied by John T. Sweet and Dan Timm,
Nebraska Game and Parks Commission

Weather and habitat conditions

Water conditions were generally poor in the Sandhills and the south central Rainwater Basin area. The May water index for the Sandhills was slightly below 1969, which was considerably below normal water. Some relatively small areas in the northern and northeastern portions had fair to good water conditions. In the Rainbasin area, water conditions were poor in the eastern part, and only fair in the central

and west. Locally heavy rains on May 24 improved water conditions in some areas. The already poor conditions were rapidly deteriorating. The May pond index was down 15 percent from 1969.

Temperatures were cool to about normal until early July when the temperatures rose to the mid to upper nineties. With the exception of some localized showers and a few isolated hail storms, precipitation was lacking from the second week of June. Water conditions continued to deteriorate from generally dry conditions in May, except in localized areas.

Breeding populations (table B-68)

Breeding pair transects were flown over the Sandhills production area during the period May 12 through 19, and over the Rainbasin area May 25 and 26. Despite poor water conditions, the total population was 6 percent above 1969, and 13 percent above 1968. The Sandhills population was calculated at 113,910, an increase of 13 percent over 1969. In the Rainbasin area, the duck breeding population was calculated to be 7,640, a decrease of 45 percent from 1969. Mallards were down 10 percent for both areas combined, pintails were unchanged, and all other puddle ducks showed substantial increases. All divers, excluding ruddy, showed large declines.

Production

Aerial brood transects were discontinued in 1970. Ground transects were extended and driven during the period July 14 through 22, 1970, in the Sandhills. A total of 44 broods with 214 ducklings were observed. The number of broods sighted on comparable portions of the transects was 12 percent below that of 1969, while the number of ducklings observed indicated a 25 percent decrease.

Summary, Nebraska Sandhills ground surveys - 1970

	Class I		Class II		Class III		Single	
	Broods	Ducklings	B	D	B	D	adults	Pairs
All species	15	72	14	68	14	73	32	9

MISSOURI

Data supplied by Richard W. Vaught,
Missouri Conservation Department

Weather and habitat conditions

Cold, dry weather in February and March was followed by more normal temperatures, heavy rainfall and repeated flooding in most of Missouri throughout April and May. June was dry again and many streams dropped to quite low water levels. Nests of most ground-nesting waterfowl were destroyed by the floods.

Production

The stream float method was used primarily for obtaining an estimate of wood duck production in Missouri. A few streams could not be checked during the survey period due to flood conditions while others became quite low and difficult to check. A comparative check was included this year on 35 miles of a formerly good wood duck stream that is now channelized. This barren area reduced the population and production estimates somewhat. Wood duck nesting studies in southeast Missouri provided measurements in an area of normally good production. In general, nesting appeared to be delayed by about two weeks. Wood duck broods noted per mile on 290 miles of stream floats and the average brood size were the second highest figures noted in the past ten years. Population counts per mile of stream were also well above normal.

Nesting success in artificial nest boxes was equal to that of last year. Waterfowl area managers indicated wood duck populations on marsh areas were also equal to those of last year. Marsh area production estimates were obviated by flood conditions. Wood duck nesting appeared to be about two weeks late but production should nearly equal that of last year. Nesting efforts of mallards, blue-winged teal, and other species are insignificant although some successful production was noted in all parts of the State.

NEVADA

Data supplied by Fred E. Wright,
Nevada Department of Fish and Game

Weather and habitat conditions

In western Nevada, abundant water flows in January filled all impoundments thereby creating good nesting habitat. Nesting activity

by mallards and pintails was delayed by cold, wet weather in April. It also had adverse effects on Canada goose production. Present water conditions are very good and brood survival is expected to be high and food plant production was good to excellent.

In northeastern Nevada, normal precipitation pattern throughout winter with a late wet spring resulted in late runoff and sustained high water. The filling of Wildhorse Reservoir in northern Elko County flooded out goose nests on this water and thus affected production. This was an excellent water year.

Eastern Nevada was generally drier this year, however, marsh conditions held fair to good and waterfowl plant production was fair to good.

Breeding population (table B-70)

Because of an overall improvement in both the quality and quantity of habitat this year and the decrease in the degree of coverage, the duck breeding pair count was probably low in light of what appears to be the best habitat conditions in the last four years. An increase of 5 percent is indicated statewide. However, it was probably closer to 15 percent. One prime area, Stillwater, recorded up to a 40 percent increase in dabblers and an 11 percent increase in redheads.

Production (table B-71)

The peak hatching period for ducks appeared to be at least three weeks later this year than in 1969 due in part to the cool spring. At the survey time, mallards were still bringing off their broods. A total of 56 percent of all broods classified during the last half of July were Class I as compared to 25 percent in 1969 and 44 percent in 1968. While early indications were for lower production, it was expected that final results would be about up 5 to 15 percent overall.

Canada goose production was down somewhat from last year, probably due to unsettled cold spring weather. Areas that produced geese last year and had nesting pairs this year, failed to bring off broods even though there was evidence of nesting effort. This would tend to affirm the adverse effect of unfavorable spring weather.

WATERFOWL KILL SURVEY

Data supplied by Robert L. Croft, Samuel M. Carney,
and Elwood M. Martin
Bureau of Sport Fisheries and Wildlife

INTRODUCTION

This report presents estimates of waterfowl hunting activity and success, including bag by species, for the 1969 waterfowl season and compares them with estimates for 1968 (Special Scientific Report -- Wildlife No. 128). These estimates are based on information obtained through the Bureau's annual Parts Collection and Mail Questionnaire Surveys of United States Waterfowl Hunters, and the United States Postal Service's reported sales of duck stamps. The 1969 hunting season marked the 18th consecutive year of the Mail Questionnaire Survey and the 9th consecutive year of the Parts Collection Survey. These surveys were designed to meet the following objectives:

1. To estimate the waterfowl bag by species and the crippling loss for ducks, geese, and coots.

2. To estimate the average number of days hunted, ducks and geese bagged per hunter, total days hunted, and the total ducks and geese bagged by waterfowl hunters.

3. To present the total number of duck stamps sold and to estimate the percentage sold to hunters and to non-hunters.

4. To measure the percent change of each of the above estimates from those of the previous year.

PROCEDURES

Selecting the Sample:

There is no complete list of waterfowl hunters. Thus, the sampling universe for the mail questionnaire survey, by necessity, consists of those post offices that sell Migratory Bird Hunting Stamps ("duck stamps"). This year, 2,542 post offices were selected as "sample outlets."

To insure even distribution of the sample outlets throughout the States, each State (depending upon its area) was divided into from one to seven geographic zones. Within zones, post offices were grouped in three strata depending upon whether they sold a small, medium, or large number of stamps. Sample outlets were randomly selected from these strata, so that the number of hunters sampled was roughly proportional to duck stamp sales of the previous year in each stratum and zone of a State.

All persons buying duck stamps at sample outlets were asked to fill out a postal "contact" card. The contact card requested the individual's name and address, the number of stamps he purchased, and the reason for his purchase.

Each person returning a contact card who purchased a stamp for the purpose of hunting (potential hunter), was mailed a questionnaire at the close of the waterfowl hunting season. He was asked the total number of days he hunted waterfowl, his total bags (birds shot down and retrieved) of ducks and mergansers, geese and brant, coots, and sea ducks (scoters, eiders, and oldsquaws), and his crippling loss (birds "knocked" down in sight but not retrieved) of these waterfowl. After three weeks, non-respondents received a follow-up questionnaire.

Computing and Adjusting the Survey Estimates:

To calculate State means for days hunted, and for both bagged and crippled ducks, geese, and coots, the following procedures were used. First, stratum means were calculated. Each stratum mean was multiplied by the proportion of the zone sales of duck stamps occurring in the stratum. The resulting products (strata totals) were added to obtain zone means. Each zone mean was in turn multiplied by the proportion of State duck stamp sales that occurred in that zone and these products were added to obtain the State means for each statistic.

State means were adjusted to 0.9637 of the calculated value to compensate for differences in estimates due to recent changes in questionnaire design. The adjusted State means were then multiplied by the number of potential waterfowl hunters in each State.

Because junior hunters (persons under 16 years old) are not required to purchase a duck stamp, they are not included in the survey. Junior hunter expansion factors based on studies in previous years were used to adjust the survey estimates for each State to include seasonal bags and crippling losses of ducks, geese, and coots, and the days hunted by juniors (table C-1).

Estimates derived from stamps sold in Washington, D. C., were proportioned among Maryland, 0.6371, Virginia, 0.3190, and North Carolina, 0.0432. All other hunting activity and harvest estimates have been assigned to the State where the hunter purchased his duck stamp. In most cases, this is the State where the hunting occurred. When it is not, estimates of hunting effort among States are somewhat in error.

Species composition of the duck and goose harvest was determined from the Parts Collection Survey. For each State, the number of wings of a given species was divided by the sum of all wings received. The quotient was assumed to represent the proportion of that species in the State kill, and is multiplied by the State kill, as estimated from the questionnaire survey, to obtain the number of birds taken. State totals by species are accumulated to obtain flyway and national totals.

In some instances (tables C-3, C-7, C-9, and C-11), the species composition derived from the wing survey was modified or supplemented in order to include or improve estimates relating to special seasons. In the States of Connecticut, Maine, Massachusetts, New Hampshire, New York, Rhode Island, and Maryland, species composition figures for sea ducks and other ducks were computed and applied separately to the respective estimates of total bag. The sea duck and other duck estimates were then added together. This was done to make better use of the questionnaire information collected on the extended sea duck season in these States. This separation was not made in other States.

September teal seasons in 1969 were held in all or parts of Alabama, Arkansas, Illinois, Indiana, Iowa, Louisiana, Mississippi, Missouri, Ohio, Colorado, Kansas, Montana, Nebraska, New Mexico, North Dakota, Oklahoma, South Dakota, Texas, and Wyoming. In these States, two estimates of ducks bagged were made: one for the September teal season, and the other for the remaining ("Regular") duck season. The estimate of the September duck kill was calculated (using the same procedures as for the regular season to estimate the State means and bag) from answers to a special question on the questionnaire. Species composition was based on hunter performance and bag check survey data. The estimates of ducks taken during both seasons were added to obtain the estimated kill of ducks for those States, and the estimated kill by species in the appropriate flyways.

For the 1968 late mallard season in Colorado, Montana, and Wyoming, details about waterfowl kill estimates were supplied by Grieb et al. (1969). This information was used to refine Bureau estimates of species composition, and late mallard season estimates are included in this report. The season was expanded in 1969 to include the "High Plains" sections of South Dakota, Nebraska, and New Mexico. In 1969, Bureau surveys provided adequate information for this season.

Adjustment factors were last calculated in 1960 using Earl L. Atwood's (1959) procedure for removing memory and prestige response-bias errors associated with reported seasonal bags of ducks, geese, and coots. Because of procedural limitations, the factors calculated at that time (table C-2) have been applied to the flyway bag estimates each year since. No adjustments are applied at the State level, since it is believed that bias varies somewhat among States.

Administrative Reports

Preliminary information derived from the 1969 Mail Questionnaire and Parts Collection Surveys was summarized in Administrative Reports 184, 185, and 186.

Special surveys conducted to estimate the whistling swan kill in Utah and Nevada, and the kill and species composition during the experimental season in San Luis Valley of Colorado, are summarized in Administrative Reports 183 and 195, respectively, but not included here.

RESULTS

Table C-3 summarizes, for each flyway and Alaska, bias-adjusted duck and coot bag estimates by species, together with unretrieved and total kill figures for ducks and coots. Information on retrieved, unretrieved, and total goose kill is presented in table C-4. Daily duck bag and possession limits, season lengths, and estimated numbers of potential adult waterfowl hunters, together with average and total numbers of days hunted, and ducks and geese bagged, unadjusted for response bias, are presented by State for each flyway in tables C-5, C-7, C-9, and C-11. Duck stamp sales and their breakdown into nonhunters and active (hunting one or more days) and successful (bagging at least one duck, goose, or coot) waterfowl hunters, are summarized by State for each flyway in tables C-6, C-8, C-10, and C-12.

A brief resume of hunter activity and success by flyway and the nation for 1969, showing degree of change from the previous year, follows:

Alaska

Duck stamp sales totaled 13,281 (+7 percent) 46,900 ducks (-33 percent), 400 coots (no change), and 19,200 geese (+86 percent) were bagged during 50,200 hunter-days afield (-8 percent). Those persons buying duck stamps for hunting, hunted an average of 3.5 days (-13 percent) and bagged an average of 4.3 ducks (-37 percent) and 1.6 geese (+74 percent) each. The estimates for Alaska are in tables C-3, C-4, C-5, and C-6.

Pacific Flyway

An estimated 4,046,500 ducks (+34 percent), 195,000 coots (+124 percent), and 363,900 geese (+28 percent) were bagged in 3,090,700 hunter-days (+24 percent), and 428,020 duck stamps (+8 percent) were sold. Potential adult hunters reported averages of 6.7 hunter-days (+15 percent), 11.5 ducks bagged (+24 percent), and 1.0 geese bagged (+18 percent). Pacific Flyway estimates are in tables C-3, C-4, C-5, and C-6.

Central Flyway

Duck stamp sales totaled 373,751 (+16 percent), and 2,518,100 ducks (+111 percent), 79,200 coots (+155 percent), and 334,000 geese (+82 percent) were bagged in 2,599,900 hunter-days (+48 percent). Potential adult hunters hunted an average of 6.5 days (+28 percent) for an average retrieved kill of 8.7 ducks (+82 percent) and 1.0 geese (+57 percent) each. Figures for the Central Flyway are in tables C-3, C-4, C-7, and C-8.

Mississippi Flyway

With duck stamp sales of 810,588 (+14 percent), 4,559,500 ducks (+88 percent), 485,700 coots (+97 percent), and 460,800 geese (+86 percent) were bagged in 5,382,100 hunter-days (+31 percent), and averages of 6.3 days (+15 percent), 7.0 ducks bagged (+65 percent), and 0.7 geese bagged (+63 percent) per potential adult hunter were recorded. Estimates for the Mississippi Flyway appear in tables C-3, C-4, C-9, and C-10.

Atlantic Flyways

Totals of 1,810,500 ducks (+33 percent), 117,200 coots (+93 percent), and 268,000 geese (+30 percent) were bagged during 2,613,900 hunter-days (+31 percent), with averages of 5.8 days (+16 percent), 4.7 ducks bagged (+17 percent), and 0.8 geese bagged (+15 percent) being registered per potential adult hunter, as duck stamp sales reached 438,372 (+14 percent). The Atlantic Flyway figures are recorded in tables C-3, C-4, C-11, and C-12.

United States

Approximately 12,981,600 ducks were bagged in the United States during the 1969 season, 61 percent more than during the previous season. The number of coots bagged during the 1969 season is estimated to have been about 877,400, 106 percent more than during the previous season. The total 1969 season bag of 1,445,900 geese is 55 percent above the 1968 figure. Except for hooded mergansers and brant (4 and 13 percent decreases, respectively), rather substantial increases occurred in the bags of all ducks, geese, and coots. Final reports indicate that 2,064,012 duck stamps were sold in 1969, 13 percent more than in 1968, and that waterfowl hunting provided about 13,736,900 hunter-days of recreation in 1969, an increase of 32 percent from the previous season. Figures for the United States appear in tables C-3, C-4, C-11, and C-12.

Literature Cited

Atwood, E. L. 1959. Procedures for removing the effect of response bias errors from waterfowl hunter questionnaire response. Unpublished report, Bureau of Sport Fisheries and Wildlife, Laurel, Maryland. 22 pages.

Grieb, J. R., H. D. Funk, R. M. Hopper, G. F. Wrakestraw, and D. Witt. 1969. Preliminary evaluation of the 1968-69 experimental mallard drake season in the Central Flyway portions of Montana, Wyoming, and Colorado. Unpublished report, Central Flyway Technical Committee Report. 1969. 34 pages.

APPENDIX

A. WATERFOWL WINTER SURVEY TABLES

TABLE A-1.--Winter survey, January 1970 - waterfowl by species and flyway

(nearest hundreds)

Species	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	Total
Ducks:					
Dabblers:					
Mallard	2,209,800	2,499,900	3,942,900	237,000	8,889,600
Black duck	Tr.[1]	Tr.[1]	137,700	234,600	422,300
Mottled duck	--	7,800	57,600	600	66,000
Gadwall	30,000	104,000	999,100	18,700	1,151,800
American widgeon	1,017,800	230,300	446,500	61,900	1,756,500
Green-winged teal	245,000	189,300	1,105,600	71,900	1,611,800
Blue-winged teal[2]	2,400	800	26,600	4,500	34,300
Shoveler	687,900	55,700	196,200	14,400	954,200
Pintail	2,449,800	879,600	710,600	142,300	4,182,300
Subtotal	6,642,700	3,967,400	7,622,800	835,900	19,068,800
Divers:					
Redhead	10,400	179,100	37,000	125,400	351,900
Canvasback	63,200	13,700	44,300	98,400	219,600
Scaup	66,700	64,300	1,043,900	396,500	1,571,400
Ring-necked duck	4,300	11,900	95,200	55,000	166,400
Goldeneye	46,200	9,900	26,500	48,300	130,900
Bufflehead	26,900	5,200	3,200	54,200	89,500
Ruddy duck	92,400	3,700	35,700	43,700	175,500
Subtotal	310,100	287,800	1,285,800	821,500	2,705,200
Miscellaneous:					
Eider	--	--	--	62,600	62,600
Scoter	113,000	--	--	97,100	210,100
Old-squaw	200	--	800	13,400	14,400
Merganser	34,400	67,700	49,400	47,500	199,000
Subtotal	147,600	67,700	50,200	220,600	486,100
Unidentified:	31,000	37,700	54,200	35,700	158,600
Total ducks	7,131,400	4,360,600	9,013,000	1,913,700	22,418,700

[1] Less than 50.

[2] Includes cinnamon teal.

TABLE A-1.--Winter survey, January 1970 - waterfowl by species and flyway--continued

(nearest hundreds)

Species	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	Total
Geese:					
Snow goose	461,700	249,100	84,700	29,500	825,000
Blue goose	--	110,200	276,100	800	387,100
Ross' goose	21,700	Tr.[1]	--	--	21,700
White-fronted goose	206,700	22,100	50,600	--	279,400
Canada goose	112,500	373,000	501,000	775,200	1,761,700
Lesser Canada goose	66,600	--	--	--	66,600
Cackling goose	97,000	--	--	--	97,000
Total geese	966,200	754,400	912,400	805,500	3,438,500
Brant:					
Black brant	10,100	--	--	--	10,100
American brant	--	--	--	106,500	106,500
Total brant	10,100	--	--	106,500	116,600
Swans:					
Whistling swan	31,000	Tr.	Tr.	55,000	86,000
Trumpeter swan	600	100	--	--	700
Total swans	31,600	100	Tr.	55,000	86,700
Coots:	517,700	163,500	827,900	275,500	1,784,600
Grand total	8,657,000	5,278,600	10,753,300	3,156,200	27,845,100

[1] Less than 50.

TABLE A-2.--Winter survey, January 1970 - waterfowl by state and flyway

(nearest hundreds)

State	Ducks	Geese[2]	Brant[2]	Swans[2]	Coots	Total
Pacific Flyway:						
Washington	1,125,000	77,500	8,900	700	25,100	1,237,200
Oregon	311,000	71,300	1,000	3,000	56,500	442,800
Idaho	663,000	8,400	200	400	9,200	681,200
Nevada	20,800	5,200	--	3,800	7,300	37,100
California	4,823,200	794,300	--	21,900	397,500	6,036,900
Utah	51,900	1,600	--	1,600	5,300	60,400
Arizona	25,200	3,400	--	Tr.[3]	16,700	45,300
Montana	77,100	2,700	--	200	200	80,200
Wyoming	2,800	100	--	--	--	2,900
Colorado	15,300	1,000	--	Tr.	Tr.	16,300
New Mexico	15,700	100	--	--	Tr.	15,800
Mexico[1]						
Flyway total	7,131,000	965,600	10,100	31,600	517,800	8,656,100
Central Flyway:						
Montana	46,700	--	--	--	Tr.	46,700
Wyoming	45,600	--	--	--	--	45,600
North Dakota	2,300	--	--	--	--	2,300
South Dakota	181,500	--	--	--	--	181,500
Nebraska	321,000	--	--	--	--	321,000
Colorado	433,000	--	--	--	--	433,000
Kansas	711,700	--	--	--	--	711,700
Oklahoma	282,300	--	--	--	3,500	285,800
New Mexico	224,700	--	--	--	7,800	232,500
Texas	2,112,000	--	--	Tr.	152,200	2,264,200
Flyway total	4,360,800	--	--	Tr.	163,500	4,524,300

1 See table A-3 for Mexico.

2 All species.

3 Less than 50.

TABLE A-2.--Winter survey, January 1970 - waterfowl by state and flyway--continued

(nearest hundreds)

State	Ducks	Geese	Brant	Swans	Coots	Total
Mississippi Flyway:						
Minnesota	18,700	12,900	--	Tr.	--	31,600
Wisconsin	14,500	3,300	--	--	--	17,800
Michigan	52,800	8,600	--	Tr.	--	61,400
Iowa	83,200	200	--	--	--	83,400
Missouri	355,600	151,000	--	Tr.	1,700	508,300
Illinois	469,900	189,300	--	--	200	659,400
Indiana	2,700	4,800	--	--	--	7,500
Ohio	60,100	10,200	--	--	--	70,300
Arkansas	1,685,600	6,000	--	--	28,100	1,719,700
Mississippi	497,500	10,600	--	--	20,100	528,200
Louisiana	5,156,400	368,300	--	--	742,500	6,267,200
Alabama	138,700	40,800	--	--	18,300	197,800
Kentucky	41,300	51,600	--	--	200	93,100
Tennessee	436,000	54,800	--	--	16,800	507,600
Flyway total	9,013,000	912,400	--	Tr.	827,900	10,753,300
Atlantic Flyway:						
Maine	50,100	300	--	--	--	50,400
New Hampshire	3,600	900	--	--	--	4,500
Vermont	2,200	--	--	--	--	2,200
Massachusetts	99,600	8,100	Tr.	--	--	107,700
Connecticut	38,600	1,100	--	--	--	39,700
Rhode Island	25,700	300	--	--	--	26,000
New York	151,000	1,200	6,700	--	500	159,400
New Jersey	266,300	102,900	96,100	100	--	465,400
Pennsylvania	14,200	9,200	--	Tr.	Tr.	23,400
Delaware	18,900	64,800	800	Tr.	700	85,200
Maryland	245,400	463,000	300	34,100	600	743,400
Virginia	93,700	138,200	1,900	5,800	--	239,600
West Virginia	2,000	100	--	--	Tr.	2,100
North Carolina	172,900	93,100	700	15,000	34,000	315,700
South Carolina	417,300	15,400	--	Tr.	53,700	486,400
Georgia	48,900	500	--	--	12,900	62,300
Florida	263,300	2,100	--	--	173,100	438,500
Flyway total	1,913,700	901,200	106,500	55,000	275,500	3,251,900

TABLE A-3.--Winter waterfowl surveys in Mexico, 1970

Species	East Coast			Central & Interior Highlands			West Coast			Total Mexico		
	1970	LCY	Percent change 1970-LCY	1970	LCY	Percent change 1970-LCY	1970	LCY	Percent change 1970-LCY	1970	LCY	Percent change 1970-LCY
Ducks:												
Dabblers:												
Tree duck	54,713	12,595	+335	25	132	- 81	2,940	26,263	- 82	57,678	38,990	+ 52
Mallard	25	105	- 76	3,475	3,410	+ 2	--	--	--	3,500	3,515	- 1
Mottled duck	1,836	584	+214	14,760	12,648	+ 17	--	--	--	16,596	13,232	+ 75
Gadwall	51,478	30,118	+ 41	22,625	17,564	+ 29	6,500	35,030	- 81	80,603	82,802	- 3
American widgeon	71,884	44,288	+ 62	44,130	23,406	+ 89	51,885	60,405	- 14	167,899	128,099	+ 69
Green-winged teal	23,383	11,859	+ 97	35,570	108,042	- 67	116,560	239,520	- 52	175,513	359,421	- 51
Blue-winged teal	176,351	108,398	+ 63	18,585	16,636	+ 12	16,000	87,710	- 82	210,936	212,744	- 1
Shoveler	67,261	10,513	+540	75,740	38,786	+ 95	97,475	218,950	- 55	240,476	268,249	- 10
Pintail	90,236	100,918	- 11	59,130	45,746	+ 29	410,160	603,229	- 32	559,526	749,893	- 25
Subtotal	537,167	319,378	+ 35	274,040	266,370	+ 3	701,520	1,271,107	- 45	1,512,727	1,856,945	- 19
Divers:												
Redhead	13,295	27,400	- 52	4,375	2,391	+ 83	49,260	50,730	- 3	66,930	80,521	- 17
Canvasback	4,889	2,335	+109	3,650	7,787	- 53	40	600	- 93	8,579	10,722	- 20
Scaup	36,417	35,759	+ 2	480	981	- 51	27,085	62,895	- 57	63,982	99,635	- 36
Ring-necked duck	107,247	16,578	+547	375	12,467	- 97	--	--	--	107,622	29,045	+270
Goldeneye	--	--	--	--	--	--	50	1,909	- 97	50	1,909	- 97
Bufflehead	1,205	111	+986	340	316	+ 8	940	1,718	- 45	2,485	2,145	+ 31
Ruddy duck	9,725	10,942	- 11	5,425	11,865	- 54	5,770	12,000	- 52	20,920	34,807	- 40
Subtotal	172,778	93,125	+ 85	14,645	35,807	- 59	83,145	129,852	- 36	270,568	258,784	+ 5
Miscellaneous:												
Mergansers	125	50	+150	50	571	- 91	2,200	805	+173	2,375	1,426	+ 66
Scoters	--	--	--	--	--	--	3,340	858	+289	3,340	858	+289
Subtotal	125	50	+150	50	571	- 91	5,540	1,663		5,715	2,284	+150
Total ducks	710,070	412,553	+ 45	288,735	302,748	- 5	790,205	1,402,622	- 44	1,789,010	2,118,013	- 16

TABLE A-3.--Winter waterfowl surveys in Mexico, 1970--continued

Species	East Coast			Central & Interior Highlands			West Coast			Total Mexico		
	1970	LCY	Percent change 1970-LCY	1970	LCY	Percent change 1970-LCY	1970	LCY	Percent change	1970	LCY	Percent change 1970-LCY
Geese:												
Canadas	3,285	4,378	- 25	--	29	--	--	--	--	3,285	4,407	- 25
Whitefronts	13,854	4,914	+ 82	4,950	9,690	- 49	2,486	3,392	- 27	21,290	17,996	+ 18
Snow/Blue	1,887	2,050	- 8	34,831	38,157	- 9	31	10	+210	36,299	40,217	- 10
Total geese	19,026	11,342	+ 68	39,781	47,876	- 17	2,517	3,402	- 26	60,874	62,620	- 3
Brant:	--	--	--	--	--	--	131,595	140,735	- 6	131,595	140,735	- 6
Coots:	473,173	434,458	+ 9	59,485	64,780	- 8	135,100	81,265	+ 66	667,758	580,503	+ 15
Grand total	1,202,269	858,353	+ 41	388,001	415,404	- 7	1,059,417	1,628,024	- 35	2,649,237	2,901,871	- 9

LCY - Last comparable year.

B. WATERFOWL BREEDING GROUND SURVEY TABLES

TABLE B-1. --Alaska - 10-year trend in breeding population indexes by species, 1961-1970

/index numbers in thousands/

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Average
Ducks:											
Dabblers:											
Mallard	108	60	83	67	27	32	42	76	53	134	68
American widgeon	42	42	27	36	40	32	59	133	144	174	73
Green-winged teal	4	2	2	10	14	17	24	45	41	63	22
Shoveler	17	7	5	7	4	5	6	32	21	33	14
Pintail	440	476	378	379	240	250	247	622	294	409	374
Subtotal	611	587	495	499	325	336	378	908	553	813	551
Divers:											
Canvasback	6	7	17	11	21	17	15	43	21	22	18
Scaup	657	657	585	562	355	425	314	498	488	441	498
Goldeneye	26	33	10	9	9	13	38	35	39	25	24
Bufflehead	31	39	37	32	29	22	30	21	26	44	31
Subtotal	720	736	649	614	414	477	397	597	574	532	571
Miscellaneous:											
Scoter	316	225	165	148	190	252	250	301	246	220	231
Eider	30	11	11	20	27	14	16	7	6	9	15
Old-squaw	87	69	94	92	49	79	87	133	93	90	87
Subtotal	433	305	270	260	266	345	353	441	345	319	333
Total ducks	1,764	1,628	1,414	1,373	1,005	1,158	1,128	1,946	1,472	1,664	1,455

TABLE B-2.--Alaska - comparative status of waterfowl breeding population indexes by species and stratum, 1969-1970

/index numbers in thousands/

Species	Stratum 37	Stratum 38	Total 1969	Total 1970	Average 1961-70	Percent change from 1969	Percent change from average
Ducks:							
Dabblers:							
Mallard	33	101	53	134	67	+153	+100
American widgeon	33	141	114	174	70	+ 53	+149
Green-winged teal	33	30	41	63	22	+ 54	+186
Shoveler	7	26	21	33	14	+ 57	+136
Pintail	198	211	294	409	374	+ 39	+ 9
Subtotal	304	509	523	813	547	+ 55	+ 49
Divers:							
Canvasback	1	21	21	22	18	+ 5	+ 22
Scaup	221	220	488	441	498	- 10	- 11
Goldeneye	11	14	39	25	24	- 36	+ 4
Bufflehead	6	38	26	44	31	+ 69	+ 42
Subtotal	239	293	574	532	571	- 7	- 7
Miscellaneous:							
Scoter	176	44	246	220	231	- 11	- 5
Eider	9		6	9	15	+ 50	- 40
Old Squaw	88	2	93	90	87	- 3	+ 3
Subtotal	273	46	345	319	333	- 7	- 4
Total ducks	816	848	1,442	1,664	1,451	+ 15	+ 15

TABLE B-3.--Alaska - whistling swan breeding population indexes, 1961-1970

/index numbers in thousands/

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	10-year average
Square miles sampled	648	492	468	414	208	212	210	212	212	212	
Number counted	759	470	567	481	298	256	208	213	367	227	
Population index	79	56	64	50	62	52	43	50	75	69	60

TABLE B-4.--Alaska - comparative brood counts from two study areas

	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Ave. (10 yrs)	1970 % change from '69	1970 % change from ave.
TETLIN													
Mallard	34	14	23	2	3	9	13	13	10	12	13	+20	- 8
Widgeon	74	18	23	6	7	36	28	39	47	11	29	-77	-62
Green-winged teal	42	30	27	19	16	66	101	103	85	44	53	-48	-17
Shoveler	2	1	--	--	--	--	1	7	4	6	2	+50	+200
Pintail	19	18	11	4	3	8	21	21	17	12	13	-29	- 8
Canvasback	14	18	14	2	3	6	9	16	7	12	10	+71	+20
Lesser scaup *	14	2	11	2	--	10	14	11	44	2	11	-95	-82
Subtotal	199	101	109	35	32	135	187	210	214	99	132	-54	-25
FORT YUKON											Ave. (8 yrs)		
Mallard			8	3	9	6	11	19	35	20	14	-43	+43
Widgeon			41	14	39	49	62	88	112	41	56	-63	-27
Green-winged teal			16	7	18	52	47	44	48	28	33	-42	-15
Shoveler			10	3	8	11	13	21	9	6	10	-33	-40
Pintail			30	9	16	19	44	39	26	13	25	-50	-48
Canvasback			8	1	13	15	16	18	18	5	12	-73	-58
Lesser scaup *			9	--	12	49	61	65	87	14	37	-84	-62
Subtotal			122	37	115	201	254	294	335	128	186	-62	-32
Total			231	72	147	336	441	504	549	227	313	-59	-28

* Scaup hatch not normally complete at time of survey.

TABLE B-5 .--Northern Alberta, northeastern British Columbia, and Northwest Territories - 10 year trend in waterfowl breeding population indexes by species, 1961-1970

(Index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Ducks:										
Dabblers:										
Mallard	1,090.4	568.4	622.6	628.7	362.5	461.2	425.1	574.0	398.7	498.7
Gadwall	4.5	5.6	5.0	10.2	37.4	4.7	10.0	40.2	8.8	10.8
American widgeon	345.8	182.2	156.4	245.6	182.4	211.6	265.9	152.0	159.0	213.9
Green-winged teal	152.1	60.3	116.6	172.1	94.6	150.9	103.1	121.9	48.3	71.3
Blue-winged teal	90.2	40.8	53.3	79.6	34.6	30.4	16.3	16.3	10.4	8.6
Shoveler	156.9	70.7	46.7	180.4	70.6	75.8	74.6	53.9	38.8	44.0
Pintail	522.0	182.8	156.3	212.8	200.5	132.5	102.4	146.3	79.2	115.1
Subtotal	2,361.9	1,108.5	1,156.9	1,529.4	982.6	1,055.1	997.4	1,104.6	743.2	962.8
Divers:										
Redhead	31.9	53.6	32.4	50.1	11.1	16.5	19.3	31.6	14.3	6.6
Canvasback	28.1	18.7	66.9	57.9	28.1	83.4	25.6	68.3	46.7	24.3
Scaup	1,682.3	1,391.0	1,538.5	1,587.7	1,470.1	1,795.5	1,895.4	1,622.0	1,674.3	1,800.7
Ring-necked	60.0	41.4	46.0	54.4	69.9	67.1	61.3	82.2	21.5	46.9
Goldeneye	157.8	86.4	13.1	69.7	65.4	17.9	24.9	22.7	18.8	12.0
Bufflehead	141.8	172.4	113.2	150.8	226.2	207.9	168.2	187.0	208.2	189.9
Ruddy	10.5	1.9	14.4	20.6	8.6	8.8	11.8	11.1	10.8	7.5
Subtotal	2,112.4	1,765.4	1,824.5	1,991.2	1,879.4	2,131.1	2,206.5	2,204.9	1,994.6	2,087.9

TABLE B-5 .--Northern Alberta, northeastern British Columbia, and Northwest Territories - 10 year trend in waterfowl breeding population indexes by species, 1961-1970--continued

(Index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Miscellaneous:										
Scoter	1,065.6	577.3	602.0	896.0	686.0	591.1	659.2	594.3	797.7	571.0
Oldsquaw	211.8	144.5	81.2	281.5	160.4	301.0	230.9	167.1	297.2	166.4
Merganser	142.1	62.1	85.0	84.4	91.6	131.7	53.8	28.4	35.0	50.9
Subtotal	1,419.5	783.9	768.2	1,262.0	938.0	972.8	943.9	789.8	1,129.9	788.3
Total ducks	5,893.8	3,657.8	3,749.6	4,782.7	3,800.0	4,159.0	4,147.8	4,099.3	3,867.7	3,839.0
Geese:										
White-fronted	8.7	6.2	1.4	2.4	4.9	1.9	1.3	6.6	14.7	4.4
Canada	39.7	25.5	60.0	20.4	17.4	26.5	16.6	11.3	20.0	30.0
Swans:	29.6	26.5	32.1	17.8	20.5	15.8	18.1	18.5	24.1	29.7
Coots:	25.0	16.4	24.9	23.5	5.4	20.2	4.7	88.4	10.1	14.2
Grand total	5,996.8	3,732.4	3,868.0	4,846.8	3,848.2	4,223.4	4,188.5	4,224.1	3,936.6	3,917.3

TABLE B-6 .--Northern Alberta, northeastern British Columbia, and Northwest Territories - waterfowl breeding population indexes by species and stratum, 1969-1970

(Index numbers in thousands)

Species	Stratum											Total		10-Year average	Percent change from:	
	13	14	15	06	07	08	09	10	11	12	05	1969	1970		1969	average
Ducks:																
Dabblers:																
Mallard	141.6	124.4	21.6	71.7	29.5	49.7	22.5	27.0	8.6	1.1	1.0	398.7	498.7	563.0	+ 25	- 11
Gadwall	8.6	--	0.9	1.3	--	--	--	--	--	--	--	8.8	10.8	13.7	+ 23	- 21
American widgeon	31.6	51.4	4.6	15.0	10.8	23.5	20.4	23.4	19.9	3.3	10.0	159.0	213.9	211.5	+ 35	+ 1
Green-winged teal	9.4	18.7	0.9	18.3	8.8	6.0	3.0	2.3	3.5	0.3	0.3	48.3	71.3	109.1	+ 48	- 35
Blue-winged teal	8.0	--	0.6	--	--	--	--	--	--	--	--	10.4	8.6	38.0	- 17	- 77
Shoveler	15.9	9.0	3.9	1.3	--	12.8	0.6	--	0.3	--	0.3	38.8	44.0	81.2	+ 13	- 46
Pintail	35.2	9.0	1.5	9.1	3.6	9.4	0.6	8.9	6.6	12.2	19.0	79.2	115.1	185.0	+ 45	- 38
Subtotal	250.3	212.5	34.0	116.7	52.7	101.4	47.1	61.6	38.9	17.0	30.6	743.2	962.8	1,201.5	+ 30	- 20
Divers:																
Redhead	--	4.5	2.1	--	--	--	--	--	--	--	--	14.3	6.6	26.7	- 54	- 75
Canvasback	6.4	4.5	2.5	3.3	--	--	--	--	6.6	--	1.0	46.7	24.3	44.8	- 48	- 46
Scaup	225.2	206.9	15.4	286.8	317.4	61.2	99.6	417.2	81.1	40.9	49.0	1,674.3	1,800.7	1,650.2	+ 8	+ 9
Ring-necked	20.7	9.0	0.4	3.3	1.6	4.7	3.0	2.3	1.6	0.3	--	21.5	46.9	55.1	+118	- 15
Goldeneye	5.4	--	2.5	--	1.6	--	--	--	0.4	0.1	2.0	18.8	12.0	48.9	- 36	- 75
Bufflehead	51.5	60.0	4.2	39.1	10.8	12.8	7.5	4.0	--	--	--	208.2	189.9	176.6	- 9	+ 8
Ruddy	6.8	--	0.7	--	--	--	--	--	--	--	--	10.8	7.5	10.6	- 31	- 29
Subtotal	316.0	284.9	27.8	332.5	331.4	78.7	110.1	423.5	89.7	41.3	52.0	1,994.6	2,087.9	2,013.0	+ 5	+ 4

TABLE B-6.--Northern Alberta, northeastern British Columbia, and Northwest Territories - waterfowl breeding population indexes by species and stratum, 1969-1970--continued

(Index numbers in thousands)

Species	Stratum											Total		10-Year average	Percent change from:	
	13	14	15	06	07	08	09	10	11	12	05	1969	1970		1969	average
Ducks:																
Miscellaneous:																
Scoter	17.5	61.0	0.1	122.6	154.3	3.4	5.4	42.7	37.8	68.2	58.0	797.7	571.0	704.0	- 28	- 19
Oldsquaw	--	2.8	--	34.6	31.1	--	--	57.3	3.1	26.5	11.0	277.2	166.4	204.2	- 44	- 19
Merganser	4.0	7.9	2.8	13.7	6.4	3.4	--	4.6	6.0	2.1	--	35.0	50.9	76.5	+ 45	- 34
Subtotal	21.5	71.7	2.9	170.9	191.8	6.8	5.4	104.6	46.9	96.8	69.0	1,129.9	788.3	984.7	- 30	- 20
Total ducks	587.8	569.1	64.7	620.1	575.9	186.9	162.6	589.7	175.5	155.10	151.6	3,867.7	3,839.0	4,199.2	- 1	- 9
Geese:																
White-fronted	--	--	--	--	--	--	--	--	--	4.4	--	14.7	4.4	5.2	- 70	- 15
Canada	1.6	2.3	0.2	3.9	14.2	--	--	6.9	--	0.9	--	20.0	30.0	26.7	+ 50	+ 12
Swans:	--	1.1	0.8	2.6	--	--	0.6	8.2	7.3	9.1	--	24.1	29.7	23.3	+ 23	+ 27
Coots:	12.9	--	0.6	--	--	0.7	--	--	--	--	--	10.1	14.2	23.3	+ 41	- 39
Grand total	602.3	572.5	66.3	626.6	590.1	187.6	163.2	604.8	182.8	156.54	151.6	3,936.6	3,917.3	4,277.7	--	+ 9

TABLE B-7 .--Northern Alberta, northeastern British Columbia, and Northwest Territories - long-term trend in duck brood indexes, July 1961-1970

(In thousands)

Stratum	10-Year average	Year									
		1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
15	19	6	3	19	9	11	21	20	29	33	35
06	280	55	133	158	709	364	505	55	283[1]	186	353
07	123	111	93	58	147	172	114	47	128	95	267
09	44	43	27	36	79	38	50	12	41	28	84
10	296	347	282	183	378	270	304	293	273	360	269
11	55	73	28	9	27	50	78	64	102	66	57
Total	817	635	566	463	1,349	905	1,072	491	856	768	1,065

[1] Dummy comparison.

TABLE B-8 .--Northern Alberta, northeastern British Columbia, and Northwest Territories - duck brood indexes by stratum compared to previous year and long-term average, 1970

(In thousands)

	Stratum						Total			Percent change from:	
	15	06	07	09	10	11	1969	1970	Average	1969	average
Broods observed	126	47	69	51	118	75	451	486	--	+ 7.8	--
Brood size[1]	5.34	6.43	5.41	5.47	5.44	5.57	5.3	5.3	--	NC	--
Index	34.7	352.5	266.6	83.7	269.0	57.3	768	1,063.8	817	+38.5	+30.2
Average	19	280	123	44	296	55	789	817	--	+ 3.5	--

[1] Based on Class II and III broods.

TABLE B-9. --Northern Saskatchewan and northern Manitoba - 8-year trend in waterfowl breeding population indexes by species, 1963-1970

(index numbers in thousands)

Species	1963	1964	1965	1966	1967	1968	1969	1970
Ducks:								
Dabblers:								
Mallard	128	150	167	135	376	374	434	584
Black duck	1	5	1	1	5	5	--	1
Gadwall	8	8	12	8	23	23	26	14
American widgeon	21	29	32	30	29	64	67	106
Green-winged teal	9	13	15	15	15	18	34	33
Blue-winged teal	29	36	14	11	20	69	48	55
Shoveler	12	26	17	16	10	13	17	22
Pintail	18	19	9	13	11	25	36	56
Subtotal	226	286	267	229	489	591	662	871
Divers:								
Redhead	10	17	18	13	28	38	15	29
Canvasback	31	37	24	17	25	36	11	42
Scaup	220	155	219	172	299	325	357	469
Ring-necked duck	94	27	60	107	74	122	102	150
Goldeneye	20	4	16	15	4	9	41	65
Bufflehead	18	8	15	25	31	74	51	65
Ruddy duck	4	1	3	3	5	18	4	2
Subtotal	397	248	355	352	466	622	581	822

TABLE B-9. --Northern Saskatchewan and northern Manitoba - 8 year trend in waterfowl breeding population indexes by species, 1963-1970--continued

(index numbers in thousands)

Species	1963	1964	1965	1966	1967	1968	1969	1970
Miscellaneous:								
Merganser	88	49	91	58	106	100	129	119
Scoter	18	8	7	28	27	59	81	24
Subtotal	106	57	98	86	133	159	210	143
Total ducks	729	591	720	667	1,088	1,372	1,453	1,836
Geese:								
Canada goose	3	4	7	8	20	17	30	9
Coots:	18	17	16	10	19	112	8	14
Grand total	750	612	743	685	1,127	1,501	1,491	1,859

TABLE B-10.--Northern Saskatchewan and northern Manitoba - comparative status of waterfowl breeding population indexes by species and stratum, 1970

(index numbers in thousands)

Species	Stratum				Total		Average	Percent change from:	
	36	17	16	48	1969	1970	1963-70	1969	average
Ducks:									
Dabblers:									
Mallard	81	202	178	123	434	584	294	+ 35	+ 99
Black duck	--	--	1	--	--	1	2	+100	- 50
Gadwall	3	4	7	--	26	14	15	- 46	- 7
American widgeon	17	49	23	17	67	106	47	+ 58	+126
Green-winged teal	4	7	12	10	34	33	19	- 3	+ 74
Blue-winged teal	14	22	16	3	48	55	35	+ 15	+ 57
Shoveler	6	7	7	2	17	22	17	+ 29	+ 29
Pintail	28	7	21	--	36	56	23	+ 55	+143
Subtotal	153	298	265	155	662	871	452	+ 32	+ 93
Divers:									
Redhead	7	21	1	--	15	29	21	+ 93	+ 38
Canvasback	9	30	3	--	11	42	28	+282	+ 50
Scaup	73	115	162	119	354	469	277	+ 32	+ 70
Ring-necked duck	15	51	52	32	102	150	92	+ 47	+ 63
Goldeneye	3	16	20	26	41	65	22	+ 59	+195
Bufflehead	6	3	22	34	51	65	36	+ 27	+ 81
Ruddy duck	1	1	--	--	4	2	5	- 50	- 60
Subtotal	114	237	260	211	581	822	480	+ 41	+ 71

TABLE B-10.--Northern Saskatchewan and northern Manitoba - comparative status of waterfowl breeding population indexes by species and stratum, 1970--continued

(index numbers in thousands)

Species	Stratum 36	17	16	48	Total 1969	1970	Average 1963-70	Percent change from: 1969	average
Miscellaneous:									
Merganser	6	30	38	45	129	119	93	- 8	+ 28
Scoter	3	7	12	2	81	24	32	-237	- 25
Subtotal	9	37	50	47	210	143	125	- 32	+ 14
Total ducks	276	572	575	413	1,453	1,836	1,057	+ 26	+ 74
Geese:									
Canada goose	2	5	2	--	30	9	12	- 70	- 25
Coots:	3	5	5	1	8	14	27	+ 75	- 48
Grand total	281	582	582	414	1,491	1,859	1,096	+ 25	+ 70

TABLE B-11.--Northern Saskatchewan and northern Manitoba - long-term trend in waterfowl brood and late-nesting indexes by species, July 1964-1970

Species	1964	1965	1966	1967	1968	1969	1970
Broods:							
Duck brood index	152	59	100	228	201	204	175
Average brood size[1]	5.0	5.1	5.4	5.4	5.5	5.5	5.6
Coot brood index	9	6	10	10	17	6	13
Late-nesting index:[2]							
Dabblers:							
Mallard	73	42	35	71	43	57	91
Gadwall	9	--	--	--	--	9	5
American widgeon	--	--	--	--	--	17	21
Green-winged teal	3	1	--	1	1	9	6
Blue-winged teal	5	4	1	2	3	7	12
Shoveler	1	2	3	3	1	10	1
Pintail	5	4	6	10	3	24	6
Black duck	--	--	--	3	--	6	--
Subtotal	96	56	46	96	55	139	142
Divers:							
Redhead	7	4	3	3	2	1	1
Canvasback	2	3	2	2	Tr.	1	1
Scaup	68	31	32	68	25	59	45
Ring-necked duck	24	37	37	28	10	31	36
Goldeneye	7	Tr.	1	2	Tr.	6	7
Bufflehead	7	6	5	9	5	16	31
Ruddy duck	2	3	2	--	--	--	1
Subtotal	117	84	82	112	42	113	122
Miscellaneous ducks	56	31	27	8	15	36	19
Total ducks	269	171	155	216	112	288	283

1 Class II and Class III broods only.

2 As indicated by adult pairs and singles.

TABLE B-12.--Northern Saskatchewan and northern Manitoba - waterfowl brood and late-nesting indexes by stratum compared to previous year and long-term average, 1970

Species	Stratum 16	48	36	17	Total Previous year	Current year	Average	Percent change from: Previous year	average
Broods:									
Duck brood index	52	31	25	67	204	175	142	- 14.2	+ 23.2
Average brood size[1]	5.9	6.1	5.8	5.0	5.5	5.6	5.4	+ 1.8	+ 3.7
Coot brood index	1	--	8	4	6	13	9	+116.7	+ 44.4
Late-nesting index:[2]									
Dabblers:									
Mallard	45	10	12	24	57	91	64	+ 59.6	+ 42.2
Gadwall	1	--	1	3	9	5	4	- 44.4	+ 25.0
American widgeon	13	3	2	3	17	21	5	+ 23.5	+320.0
Green-winged teal	5	--	1	--	9	6	3	- 33.3	+100.0
Blue-winged teal	3	2	1	6	7	12	5	+ 71.4	+140.0
Shoveler	--	--	1	--	10	1	3	- 90.0	- 66.7
Pintail	5	--	1	--	24	6	8	- 75.0	- 25.0
Black duck	--	--	--	--	6	--	1	-100.0	-100.0
Subtotal	72	15	19	36	139	142	93	+ 2.2	+ 52.7
Divers:									
Redhead	--	--	1	--	--	1	3	+100.0	- 66.7
Canvasback	--	--	1	--	1	1	3	00.0	- 66.7
Scaup	19	7	7	12	59	45	54	- 27.7	- 16.7
Ring-necked duck	9	9	6	12	31	36	28	+ 16.1	+ 28.6
Goldeneye	1	2	1	3	6	7	5	+ 16.7	+ 40.0
Bufflehead	16	5	1	9	16	31	10	+ 93.7	+210.0
Ruddy duck	--	--	1	--	--	1	1	00.0	00.0
Subtotal	45	23	18	36	113	122	104	+ 8.0	+ 17.3

TABLE B-12.--Northern Saskatchewan and northern Manitoba - waterfowl brood and late-nesting indexes by stratum compared to previous year and long-term average, 1970--continued

Species	Stratum				Total			Percent change from:	
	16	48	36	17	Previous year	Current year	Average	Previous year	average
Miscellaneous ducks	3	7	--	9	36	19	40	- 47.2	- 52.5
Grand total	120	45	37	81	288	283	237	- 1.7	+ 19.4

1 Class II and III broods only.

2 As indicated by adult pairs and singles.

TABLE B-13.--Northern and western Ontario - 10-year trend in waterfowl breeding populations indexes by species, 1961-1970

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Average[1]	Percent change from: 1969	Percent change from: average
Ducks:													
Dabblers:													
Mallard	64	125	50	56	16	38	41	30	39	47	50.6	+ 21	- 7
Black duck	25	48	24	25	12	12	10	27	22	11	21.6	- 50	- 51
Gadwall	--	--	--	1	--	--	2	--	--	--	.3	--	--
American widgeon	4	7	3	4	4	2	1	6	1	--	3.2	--	--
Green-winged teal	2	4	1	6	--	4	2	4	--	13	3.6	--	+189
Blue-winged teal	--	--	1	1	--	--	1	--	--	5	.8	--	+525
Shoveler	--	--	--	--	--	--	1	--	--	--	.1	--	--
Pintail	2	--	2	2	--	2	2	6	3	2	2.1	--	--
Subtotal	97	184	81	95	32	58	60	73	65	78	82.3	+ 20	- 5
Divers:													
Redhead	--	--	--	--	--	--	2	--	1	--	.3	--	--
Canvasback	4	--	1	--	--	--	--	--	--	--	.5	--	--
Scaup	51	46	36	42	29	34	41	71	44	44	43.8	--	--
Ring-necked duck	1	45	27	15	18	44	20	1	7	15	19.3	+114	- 22
Goldeneye	29	67	27	19	1	20	13	87	33	19	31.5	- 42	- 40
Bufflehead	5	10	9	1	1	2	2	26	18	42	11.6	+133	+262
Ruddy duck	6	3	--	--	--	--	--	--	--	1	1.0	--	--
Subtotal	96	171	100	77	49	100	78	185	103	121	108.0	+ 5	+ 12

TABLE B-13.--Northern and western Ontario - 10-year trend in waterfowl breeding populations indexes by species, 1961-1970--continued

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	Average[1]	Percent change from: 1969	Percent change from: average
Miscellaneous:													
Scoter	2	--	4	--	--	2	1	38	7	8	8.9	--	- 10
Oldsquaw	--	--	--	--	--	--	--	2	--	--	.2	--	--
Merganser	93	109	78	60	54	91	103	81	133	100	90.2	- 25	+ 11
Subtotal	95	109	82	60	54	93	104	121	140	108	96.6	- 23	+ 12
Total ducks	95	464	263	232	135	251	242	379	308	307	285.4	--	+ 9
Geese:													
Canada	--	4	28	24	10	19	21	32	5	7	16.6	+ 40	- 58
Grand total	288	468	291	256	145	270	263	411	313	314	302.0	--	+ 4

[1] Includes current year.

TABLE B-14.--Southern Alberta - long-term trend in pond indexes by strata with comparisons to average and previous year - May and July 1970

/index numbers in thousands/

Year	Stratum			Total
	26	27	28	
May:				
1961	213	432	56	701
1962	132	345	49	526
1963	189	601	59	849
1964	153	366	113	632
1965	299	637	103	1,039
1966	282	490	72	844
1967	260	361	140	761
1968	103	307	92	502
1969	213	399	69	681
1970	230	486	62	778
Average 1956-62	238	436	89	763
Percent change from 1969	+ 8.0	+ 21.8	- 10.1	+ 14.2
Percent change from average	- 3.4	+ 11.5	- 30.3	+ 2.0
July:				
1961	56	153	30	239
1962	72	257	39	368
1963	162	471	60	693
1964	87	162	59	308
1965	260	485	111	856
1966	187	234	66	487
1967	182	280	92	554
1968	90	159	66	315
1969	122	228	41	391
1970	115	325	38	478
Average 1956-62	117	258	44	419
Percent change from 1969	- 5.7	+ 42.5	- 7.3	+ 22.2
Percent change from average	- 1.7	+ 26.0	- 13.6	+ 14.1

TABLE B-15.--Southern Alberta - 10-year trend in waterfowl breeding population indexes by species, 1961-1970

/index numbers in thousands/

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Ducks:										
Dabblers:										
Mallard	860	729	745	836	339	567	628	444	518	649
Gadwall	110	89	86	101	60	110	152	184	152	94
American widgeon	189	127	134	213	56	128	171	103	104	154
Green-winged teal	65	14	15	24	14	32	43	50	43	41
Blue-winged teal	172	60	61	114	80	115	161	82	59	82
Shoveler	171	124	192	210	98	173	215	127	202	146
Pintail	290	233	353	274	343	429	607	144	572	528
Subtotal	1,857	1,376	1,586	1,772	990	1,554	1,977	1,134	1,650	1,694
Divers:										
Redhead	40	21	38	44	30	47	60	20	40	27
Canvasback	38	49	49	56	40	29	40	24	30	55
Scaup	248	214	263	259	134	180	188	155	221	180
Ring-necked duck	2	1	Tr	Tr	3	2	12	4	5	6
Goldeneye	3	2	1	1	Tr	1	0	1	2	1
Bufflehead	31	12	14	15	10	14	19	11	18	15
Ruddy duck	19	19	10	17	8	18	26	17	11	15
Subtotal	381	318	375	392	225	291	345	232	327	299

TABLE B-15.--Southern Alberta - 10-year trend in waterfowl breeding population indexes by species, 1961-1970--continued

/index numbers in thousands/

Species	1961	1962	1963	1964	1965	1966	1967	1968	1968	1970
Ducks:										
Miscellaneous:										
Scoter	43	48	17	32	20	24	21	21	26	27
Mergansers	--	--	--	--	3	3	1	Tr	Tr	4
Subtotal	43	48	17	32	23	27	22	21	26	31
Total ducks	2,281	1,742	1,978	2,196	1,238	1,872	2,344	1,387	2,003	2,024
Geese:										
Canada goose	--	--	2	5	4	4	7	2	4	7
Coots:										
American coot	97	22	62	89	48	49	119	53	106	92
Grand total	2,378	1,764	2,042	2,290	1,290	1,925	2,470	1,442	2,113	2,123

Note: Canada geese not included before 1963 and mergansers not included before 1965.

TABLE B-16.--Southern Alberta - comparative status of waterfowl breeding population indexes by species and stratum, 1970

/index numbers in thousands/

Species	Stratum			Total		Average	Percent change from--	
	26	27	28	1969	1970	1956-62	1969	Average
Ducks:								
Dabblers:								
Mallard	175	396	78	518	649	1,012	+ 25.3	- 35.9
Gadwall	40	48	6	152	94	100	- 38.2	- 6.0
American widgeon	66	65	23	104	154	187	+ 48.1	- 17.6
Green-winged teal	10	29	2	43	41	43	- 4.6	- 4.6
Blue-winged teal	27	48	7	59	82	151	+ 39.0	- 45.7
Shoveler	72	62	12	202	146	187	- 27.7	- 21.9
Pintail	273	174	81	572	528	533	- 7.7	- 0.9
Subtotal	663	822	209	1,650	1,694	2,213	+ 2.7	- 23.4
Divers:								
Redhead	5	21	1	40	27	48	- 32.5	- 43.8
Canvasback	12	43	Tr	30	55	60	+ 83.3	- 8.3
Scaup	46	119	15	221	180	281	- 18.6	- 35.9
Ring-necked duck	2	4	Tr	5	6	1	+ 20.0	+500.0
Goldeneye	0	1	Tr	2	1	3	- 50.0	- 66.7
Bufflehead	1	14	0	18	15	21	- 16.7	- 28.6
Ruddy duck	4	11	Tr	11	15	21	+ 36.4	- 28.6
Subtotal	70	213	16	327	299	435	- 8.6	- 31.3
Miscellaneous:								
Scoter	0	27	0	26	27	40	+ 3.8	- 32.5
Mergansers	1	1	2	Tr	4	Tr	+ ----	+ ----
Total ducks	734	1063	227	2,003	2,024	2,688	+ 1.0	- 24.7
Geese:								
Canada goose	4	1	2	4	7	4	+ 75.0	+ 75.0
Coots:								
American coot	30	60	2	106	92	76	- 13.2	+ 21.0
Grand total	768	1124	231	2,113	2,123	2,768	+ 0.5	- 23.3

TABLE B-17.--Southern Alberta - lone drake index: long-term trend expressed as a percentage of total drakes, 1961-70

Year	Mallard	Pintail	Canvasback	Total
1961	77.10	74.22	63.89	76.00
1962	82.39	83.98	54.32	82.00
1963	84.99	85.25	80.08	84.86
1964	85.28	88.14	52.65	84.57
1965	82.07	75.17	65.02	77.85
1966	80.97	74.99	56.09	77.94
1967	83.60	64.14	70.60	79.63
1968	64.11	62.13	27.78	62.46
1969	86.71	82.48	68.58	84.14
1970	78.22	80.70	61.48	78.49

TABLE B-18.--Southern Alberta - long-term trend in waterfowl brood and late-nesting indexes by species, July 1962-70

/index numbers in thousands/

Species	1962	1963	1964	1965	1966	1967	1968	1969	1970
Broods:									
Duck brood index	132.1	204.3	190.4	107.4	172.2	164.9	94.8	141.7	87.5
Average brood size	5.6	6.0	6.0	6.1	6.6	5.9	5.2	5.9	5.6
Coot brood index	18.8	19.4	18.5	16.6	34.8	25.3	2.1	16.4	15.4
Late-nesting index									
Dabblers:									
Mallard	1.4	1.6	3.2	12.2	15.3	14.4	14.7	7.7	15.7
Gadwall	0.2	1.1	1.2	7.9	7.0	6.5	8.6	2.6	15.8
American widgeon	0.2	0.1	1.1	5.2	2.4	2.4	4.3	3.2	3.9
Green-winged teal	0	0	0	0.4	2.4	5.4	2.0	5.7	6.3
Blue-winged teal	0.1	0.1	0.3	7.4	5.1	2.6	4.0	6.8	7.1
Shoveler	0.2	1.1	1.4	8.1	5.1	7.8	2.7	3.1	6.3
Pintail	0	0.1	0.2	7.7	11.7	8.4	5.2	11.9	7.2
Subtotal	2.1	4.1	7.4	48.9	49.0	47.5	41.5	41.0	62.3
Divers:									
Redhead	0.2	0.2	0.2	2.4	1.3	2.0	1.2	1.4	1.8
Canvasback	0.2	0	0	0.5	0.6	0	1.6	1.2	0.4
Scaup	1.0	1.3	3.2	14.2	9.9	7.8	8.2	13.3	19.4
Ring-necked duck	0	0	0	0	0	0.3	0	0	1.0
Goldeneye	0	0	0	0.1	0.1	0	0.7	0.4	0.2
Bufflehead	0	0	0	0	0	0	0	0.3	0
Ruddy duck	0.6	2.3	0.9	5.0	6.8	2.0	4.6	3.7	5.0
Subtotal	2.0	3.8	4.3	22.2	18.7	12.1	16.3	20.3	27.8
Grand total	4.1	7.9	11.7	71.1	67.7	59.6	57.8	61.3	90.1

Note: Average duck brood size determined from Class II and III broods only. Late-nesting index is indicated by adult pairs and singles.

TABLE B-19.--Southern Alberta - waterfowl brood and late-nesting indexes by stratum compared to previous year and 1956-62 average, 1970

/index numbers in thousands/

Species	Strata			Total		Average	Percent change from	
	26	27	28	1969	1970	1956-62	1969	Average
Broods:								
Duck brood index	36.0	43.5	8.0	141.7	87.5	249.8	- 38.2	- 65.0
Average brood size	5.6	5.6	5.4	5.9	5.6	5.8	- 5.1	- 3.4
Coot brood index	2.1	13.0	0.3	16.4	15.4	55.6	- 6.1	- 72.3
Late-nesting index								
Dabblers:								
Mallard	4.8	8.0	2.9	7.7	15.7	4.1		
Gadwall	5.5	8.9	1.4	2.6	15.8	1.8		
American widgeon	0.9	2.2	0.8	3.2	3.9	0.8		
Green-winged teal	1.2	4.8	0.3	5.7	6.3	0.1		
Blue-winged teal	1.4	4.6	1.1	6.8	7.1	1.5		
Shoveler	1.2	3.6	1.5	3.1	6.3	0.8		
Pintail	1.4	4.3	1.5	11.9	7.2	1.0		
Subtotal	16.4	36.4	9.5	41.0	62.3	10.1	+ 52.0	+516.8
Divers:								
Redhead	0.4	1.2	0.2	1.4	1.8	0.5		
Canvasback	0.4	0	0	1.2	0.4	0.3		
Scaup	3.7	13.8	1.9	13.3	19.4	7.7		
Ring-necked duck	0.5	0.5	0	0	1.0	0.1		
Goldeneye	0	0	0.2	0.4	0.2	0.1		
Bufflehead	0	0	0	0.3	0	0.2		
Ruddy duck	0.2	4.8	0	3.7	5.0	2.9		
Subtotal	5.2	20.3	2.3	20.3	27.8	11.8	+ 36.9	+135.6
Grand total	21.6	56.7	11.8	61.3	90.1	21.9	+ 47.0	+311.4

Note: Average duck brood size determined from Class II and III broods only. Late-nesting index is indicated by adult pairs and singles.

TABLE B-20.--Southern Saskatchewan - long-term pond indexes by strata and comparison to average and previous year, May 1952 to 1970

(index numbers in thousands)

Year	Stratum					Total
	A-West (19)	A-East (20)	B-West (21)	B-East (22)	C (23)	
May:						
1952	726.6	296.4	384.7	772.2	126.4	2,306.3
1953	974.6	508.1	678.7	1,362.3	203.3	3,727.0
1954	722.1	931.8	800.5	1,606.8	203.4	4,264.6
1955	886.6	1,295.0	549.7	1,103.3	198.4	4,033.0
1956	700.3	754.4	284.2	644.8	105.8	2,489.5
1957	357.9	292.3	148.5	576.2	72.2	1,447.1
1958	350.5	526.5	191.0	489.6	105.1	1,662.7
1959	160.2	157.7	57.4	334.5	73.6	783.4
1960	377.3	479.2	164.3	987.4	90.1	2,098.3
1961	171.1	48.7	92.0	221.4	55.7	588.9
1962	336.3	153.2	173.3	635.4	49.1	1,347.3
1963	256.0	239.4	131.6	293.9	39.5	960.4
1964	202.1	508.1	114.9	325.9	37.7	1,188.7
1965	453.0	393.6	224.4	484.9	81.4	1,637.3
1966	392.4	556.1	231.1	603.1	97.3	1,880.0
1967	523.3	449.1	216.8	746.2	142.1	2,077.5
1968	215.4	123.4	130.4	301.1	29.9	800.2
1969	608.9	304.5	302.2	546.5	100.6	1,862.7
1970	716.1	638.3	326.5	949.8	145.6	2,776.3
Average 1956-1962	350.5	344.6	158.7	555.6	78.8	1,488.2
Percent change:						
1970 from 1969	+ 17.6	+109.6	+ 8.0	+ 73.8	+ 44.7	+ 49.0
1970 from average	+104.3	+ 85.2	+105.7	+ 71.0	+ 84.8	+ 86.6

TABLE B-21--Southern Saskatchewan - 10-year trend in waterfowl breeding population indexes by species, 1961-1970

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Ducks										
Dabblers:										
Mallard	994.6	674.1	774.4	671.4	537.4	862.5	982.9	949.2	937.5	1,169.5
Black duck	--	--	--	--	--	--	--	--	--	--
Gadwall	35.6	64.8	103.0	161.6	131.3	121.2	190.9	177.4	214.7	171.3
American widgeon	82.2	49.9	73.0	88.8	80.2	110.7	210.4	124.1	225.6	180.7
Green-winged teal	13.9	5.3	9.1	7.8	13.0	14.9	35.8	23.9	39.1	91.2
Blue-winged teal	92.2	38.5	59.0	125.5	105.2	154.4	203.6	107.5	138.2	165.9
Shoveler	108.7	27.6	101.4	177.4	112.4	268.2	258.5	185.2	288.8	313.5
Pintail	220.6	215.8	257.7	254.5	297.1	539.4	575.3	290.6	653.5	886.5
Wood duck	--	--	--	--	--	--	--	--	--	--
Subtotal	1,547.8	1,076.0	1,377.6	1,487.0	1,276.6	2,071.3	2,457.4	1,857.9	2,497.4	2,978.6
Divers:										
Redhead	23.5	57.6	14.0	31.6	35.3	45.7	47.5	49.2	37.8	57.8
Canvasback	82.9	94.6	52.4	57.5	60.8	100.5	70.5	64.8	83.5	135.2
Scaup	130.8	157.0	58.3	64.8	97.2	129.0	106.5	93.2	133.8	107.3
Ring-necked duck	3.3	--	5.7	10.4	10.5	8.7	6.4	1.1	2.8	6.1
Goldeneye	4.7	2.4	1.6	1.2	3.0	6.3	4.8	7.5	2.8	4.4
Bufflehead	11.2	1.5	10.0	9.1	19.8	12.9	14.2	26.1	28.7	15.7
Ruddy duck	27.3	13.4	9.9	10.0	12.3	19.5	12.7	28.0	14.4	10.1
Subtotal	283.7	326.5	151.9	184.6	238.9	322.6	262.6	269.9	303.8	336.6

TABLE B-21.--Southern Saskatchewan - 10-year trend in waterfowl breeding population indexes by species, 1961-1970--continued

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Miscellaneous:										
Scoter	5.7	--	4.3	8.2	9.5	3.8	2.0	8.2	4.2	1.2
Merganser	4.0	--	5.4	1.4	1.8	--	0.7	0.6	0.7	4.4
Subtotal	9.7	--	9.7	9.6	11.3	3.8	2.7	8.8	4.9	5.6
Total ducks	1,841.2	1,402.5	1,539.2	1,681.2	1,526.8	2,397.7	2,722.7	2,136.6	2,806.1	3,320.8
Geese										
Canada goose	2.5	2.5	3.6	3.2	3.0	3.9	2.1	1.6	6.9	5.6
Coots	73.4	56.4	26.2	43.2	52.0	61.9	92.5	106.3	141.3	148.6
Grand total	1,917.1	1,461.4	1,569.0	1,727.6	1,581.8	2,463.5	2,817.3	2,244.5	2,954.3	3,475.0

TABLE B-22.--Southern Saskatchewan - comparative status of waterfowl breeding population indexes by species and stratum, 1970

(index numbers in thousands)

Species	A-West	A-East	B-West	B-East	C	Total Previous year	Total Current year	Average 1956 to 1962	Percent change from previous year	Percent change from previous Average
	(19)	(20)	(21)	(22)	(23)					
Ducks										
Dabblers:										
Mallard	401.7	153.6	272.5	271.7	70.0	937.5	1,169.5	1,781.6	+ 24.8	- 34.4
Black duck	--	--	--	--	--	--	--	0.1	--	--
Gadwall	79.6	15.2	30.9	28.1	17.5	214.7	171.3	73.3	- 20.2	+133.7
American widgeon	81.6	19.2	35.8	32.8	11.3	225.6	180.7	173.0	- 19.9	+ 4.5
Green-winged teal	43.3	5.5	15.8	21.3	5.3	39.1	91.2	26.2	+133.3	+248.1
Blue-winged teal	45.2	61.8	30.9	22.2	5.8	138.2	165.9	184.7	+ 20.0	- 10.2
Shoveler	136.8	40.7	57.3	56.6	22.1	288.8	313.5	207.9	+ 8.6	+ 50.8
Pintail	487.7	86.8	111.3	117.6	83.1	653.5	886.5	736.2	+ 35.7	+ 20.4
Wood duck	--	--	--	--	--	--	--	--	--	--
Subtotal	1,275.9	382.8	554.5	550.3	215.1	2,497.4	2,978.6	3,183.0	+ 19.3	- 10.7
Divers:										
Redhead	16.4	6.2	12.1	22.2	0.9	37.8	57.8	70.3	+ 52.9	- 17.8
Canvasback	35.0	12.8	41.2	43.9	2.3	83.5	135.2	125.9	+ 61.9	+ 7.4
Scaup	37.7	16.7	23.6	22.8	6.5	133.8	107.3	243.6	- 19.8	- 56.0
Ringnecked duck	1.2	0.4	0.8	3.5	0.2	2.8	6.1	8.1	+117.9	- 24.7
Goldeneye	0.4	0.1	1.8	2.1	--	2.8	4.4	6.7	+ 57.1	- 34.3
Bufflehead	0.2	1.3	5.4	8.4	0.4	28.7	15.7	10.4	- 45.3	+ 50.9
Ruddy duck	2.8	1.2	3.4	2.7	--	14.4	10.1	41.2	- 29.9	- 75.5
Subtotal	93.7	38.7	88.3	105.6	10.3	303.8	336.6	506.2	+ 10.8	- 33.5

TABLE B-22.--Southern Saskatchewan - comparative status of waterfowl breeding population indexes by species and stratum, 1970--continued

(index numbers in thousands)

Species	A-West	A-East	B-West	B-East	C	Total Previous year	Total Current year	Average 1956 to 1962	Percent change from previous year	Percent change from previous Average
	(19)	(20)	(21)	(22)	(23)					
Miscellaneous:										
Scoters	--	--	0.6	0.6	--	4.2	1.2	6.2	- 71.4	- 80.6
Merganser	2.2	--	0.6	1.6	--	0.7	4.4	2.3	+528.5	+ 91.3
Subtotal	2.2	--	1.2	2.2	--	4.9	5.6	8.5	+ 14.3	- 34.1
Total ducks	1,371.8	421.5	644.0	658.1	225.4	2,806.1	3,320.8	3,697.7	+ 18.3	- 10.2
Geese										
Canada goose:	0.8	--	--	2.7	2.1	6.9	5.6	1.3	- 18.8	+430.7
Coots	53.3	40.7	19.5	32.0	3.1	141.3	148.6	201.6	+ 5.2	- 26.3
Grand total	1,425.9	462.2	663.5	692.8	230.6	2,954.3	3,475.0	3,900.6	+ 17.6	- 10.9

TABLE B-23.--Southern Saskatchewan - lone drake index: long-term trend expressed as percentage of total drakes, 1956-

Year	Mallard	Pintail	Canvasback	Total
1956	76.44	82.68	63.21	78.46
1957	83.49	85.97	75.44	83.83
1958	79.38	81.33	73.68	79.55
1959	74.58	69.44	46.39	72.96
1960	85.92	82.47	71.57	84.65
1961	73.90	69.94	44.97	71.90
1962	51.66	36.35	39.83	47.32
1963	82.81	82.92	77.77	82.59
1964	85.21	82.32	65.64	83.47
1965	82.11	83.69	68.02	81.77
1966	81.75	82.66	77.57	82.98
1967	86.80	82.13	56.50	83.80
1968	80.24	75.50	47.65	77.88
1969	88.37	85.10	64.14	85.92
1970	82.10	78.28	65.35	79.60

TABLE B-24.--Southern Saskatchewan - long-term pond indexes by strata and comparison to average and previous year, July 1952 to 1970

(index numbers in thousands)

Year	Stratum					Total
	A-West (19)	A-East (20)	B-West (21)	B-East (22)	C (23)	
July:						
1952	338.7	131.4	99.1	198.9	86.9	855.0
1953	812.8	748.9	295.7	593.5	100.5	2,551.4
1954	362.8	1,326.9	421.7	846.6	79.1	3,037.1
1955	889.9	1,493.6	391.2	785.3	233.7	3,793.7
1956	416.2	601.7	184.8	495.7	55.1	1,753.5
1957	250.2	403.4	127.7	437.7	35.3	1,254.3
1958	141.8	212.8	107.1	267.4	33.8	762.9
1959	120.5	143.0	36.8	145.0	26.0	471.3
1960	265.2	212.4	88.0	318.1	32.7	916.4
1961	50.6	34.4	37.1	61.2	9.8	193.1
1962	61.8	75.7	26.3	68.6	13.3	245.7
1963	227.4	173.8	84.5	161.8	41.6	689.1
1964	97.3	177.8	30.5	121.6	12.3	439.5
1965	280.1	157.3	102.8	288.5	92.6	921.3
1966	239.6	172.5	144.5	502.8	63.8	1,123.2
1967	193.4	94.0	80.9	218.0	45.9	632.2
1968	89.5	38.0	65.4	161.5	17.6	372.0
1969	376.2	171.3	127.8	234.8	62.2	972.3
1970	574.6	288.7	277.6	550.8	73.1	1,764.8
Average 1956-1962	186.6	240.5	86.8	256.3	29.4	799.6
Percent change:						
1970 from 1969	+ 52.7	+ 68.5	+117.2	+134.6	+ 17.5	+ 81.5
1970 from average	+200.0+	+ 20.0	+200.0+	+114.9	+148.6	+120.7

TABLE B-25.--Southern Saskatchewan - 10-year trend in waterfowl brood and late-nesting indexes by species, July 1970

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Broods:										
Duck brood index	68.7	32.8	45.8	66.9	49.8	96.3	98.6	81.5	195.0	137.5
Average brood size[1]	4.4	4.9	5.4	5.7	6.0	6.0	5.5	5.0	5.6	5.1
Coot brood index	6.0	0.1	5.2	9.2	8.3	7.6	11.8	14.0	23.4	29.4
Late-nesting index[2]										
Dabblers:										
Mallard	19.6	8.5	23.1	19.7	48.1	46.3	26.8	25.1	49.1	120.0
Gadwall	0.8	2.1	9.7	3.8	19.2	17.2	14.2	9.4	29.2	38.4
American widgeon	0.8	2.1	3.5	0.3	8.0	7.7	6.7	4.3	19.5	40.0
Green-winged teal	--	--	0.9	--	2.0	4.1	4.0	5.6	3.5	19.0
Blue-winged teal	1.4	1.3	8.1	5.3	16.2	26.5	22.9	8.6	20.7	29.5
Shoveler	1.2	0.4	3.1	1.5	8.1	5.2	5.9	2.8	8.0	22.2
Pintail	1.6	3.8	6.5	1.2	7.1	10.7	9.0	5.7	28.1	62.4
Subtotal	25.4	18.2	54.9	31.8	108.7	117.7	89.5	61.5	158.1	331.5
Divers:										
Redhead	--	0.2	1.6	1.3	3.1	3.6	4.3	3.0	3.2	5.3
Canvasback	1.0	--	0.6	0.8	1.0	0.4	2.4	2.4	0.6	7.2
Scaup	4.8	0.4	2.8	8.9	3.2	8.2	2.8	2.7	8.6	20.4
Ring-necked duck	1.6	0.2	2.3	0.1	0.4	0.2	0.8	--	0.2	0.2
Goldeneye	--	--	--	0.2	--	--	--	--	--	2.7
Bufflehead	1.2	--	--	0.8	1.0	2.8	2.0	0.8	2.9	1.6
Ruddy duck	0.5	0.8	4.0	4.2	4.0	12.5	13.0	8.0	4.5	5.7
Subtotal	9.1	1.6	11.3	16.3	12.7	27.7	25.3	16.9	20.0	43.1

TABLE B-25.--Southern Saskatchewan - 10-year trend in waterfowl brood and late-nesting indexes by species, July 1970--continued

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Ducks:										
Miscellaneous	--	--	1.4	--	--	--	--	--	0.1	--
Total	34.5	19.8	67.6	48.1	121.4	145.4	114.8	78.4	178.2	374.6

[1]Class II and III broods only
[2]As indicated by adult pairs and singles.

TABLE B-26.--Southern Saskatchewan - waterfowl brood and late-nesting indexes by stratum compared to previous year and long-term average, 1970

(index numbers in thousands)

Species	Stratum					Total			Percent change from--	
	A-West (19)	A-East (20)	B-West (21)	B-East (22)	C (23)	Previous year	Current year	1958 to 1964	1969	Average
Broods:										
Duck brood index	51.4	7.9	28.3	43.7	6.2	195.0	137.5	232.0[3]	- 29.5	- 40.7
Average brood size[1]	5.0	6.3	5.1	5.2	4.8	5.6	5.1	4.7[3]	- 8.9	+ 8.5
Coot brood index	5.3	2.0	6.1	16.0	--	23.4	29.4	54.8[3]	+ 25.6	- 48.2
Late-nesting index[2]										
Dabblers:										
Mallard	41.4	9.9	16.5	46.0	6.2	49.1	120.0	40.0	+144.4	+200.0
Gadwall	20.8	0.8	5.3	9.7	1.8	29.2	38.4	6.1	+ 31.5	+500.0+
American widgeon	19.4	0.5	10.0	9.4	0.7	19.5	40.0	5.3	+105.1	+500.0+
Green-winged teal	11.7	--	2.7	3.9	0.7	3.5	19.0	0.6	+400.0+	+500.0+
Blue-winged teal	15.6	2.7	5.3	4.7	1.2	20.7	29.5	11.6	+ 42.5	+154.3
Shoveler	11.5	0.8	3.1	4.7	2.1	8.0	22.2	2.9	+177.5	+500.0+
Pintail	36.5	1.2	14.9	7.0	2.8	28.1	62.4	5.1	+122.1	+500.0+
Subtotal	156.9	15.9	57.8	85.4	15.5	158.1	331.5	71.6	+109.7	+300.0+
Divers:										
Redhead	2.3	0.2	2.0	0.8	--	3.2	5.3	1.4	+ 65.6	+200.0+
Canvasback	2.3	0.2	1.2	3.1	0.4	0.6	7.2	1.2	+500.0+	+500.0+
Scaup	7.8	1.0	4.3	2.3	5.0	8.6	20.4	7.0	+137.2	+191.4
Ring-necked duck	0.2	--	--	--	--	0.2	0.2	0.9	--	- 77.8
Goldeneye	1.5	--	1.2	--	--	--	2.7	0.3	--	+500.0+
Bufflehead	0.4	--	1.2	--	--	2.9	1.6	0.3	- 44.8	+400.0+
Ruddy duck	1.9	0.8	1.0	1.6	0.4	4.5	5.7	5.6	+ 26.7	+ TR
Subtotal	16.4	2.2	10.9	7.8	5.8	20.0	43.1	16.7	+115.5	+158.1

TABLE B-26.--Southern Saskatchewan - waterfowl brood and late-nesting indexes by stratum compared to previous year and long-term average, 1970--continued

(index numbers in thousands)

Species	Stratum					Total		1958 to 1964	Percent change from--	
	A-West (19)	A-East (20)	B-West (21)	B-East (22)	C (23)	Previous year	Current year		1969	Average
Ducks:										
Miscellaneous	--	--	--	--	--	0.1	--	0.6	--	--
Total	173.3	18.1	68.7	93.2	21.3	178.2	374.6	88.9	+110.2	+321.4

[1] Class II and III broods only.
[2] As indicated by adult pairs and singles.
[3] Average based on years 1956-1962. Late nesting index figures not comparable previous to 1958.

TABLE B-27.--Southern Manitoba - long-term trend in pond indexes by strata with comparisons to 1956-62 average and previous year, May and July, 1970

(index numbers in thousands)

	Year	Stratum 24(A)	Stratum 25(B)	Total 24 & 25
May	1954	258	428	686
	1955	315	428	743
	1956	391	615	1,006
	1957	262	404	666
	1958	352	264	616
	1959	160	482	642
	1960	324	295	619
	1961	158	263	421
	1962	135	295	430
	1963	298	331	629
	1964	398	331	729
	1965	327	478	805
	1966	372	515	887
	1967	315	547	862
	1968	119	238	357
	1969	208	246	454
	1970	411	381	792
Average 1956 through 1962:		255	374	629
Percent change from 1970-1969:		+ 98	+ 55	+ 74
1970 from 1956-62 average:		+ 61	+ 02	+ 26
July	1954	473	384	857
	1955	339	271	610
	1956	425	411	836
	1957	241	260	501
	1958	163	341	504
	1959	96	325	420
	1960	164	212	376
	1961	41	86	129
	1962	97	135	232
	1963	145	178	323
	1964	201	182	383
	1965	129	260	389
	1966	167	240	407
	1967	100	174	274
	1968	48	116	164
	1969	158	187	345
	1970	222	191	413
Average 1956 through 1962:		175	253	428
Percent change from 1970-1969:		+ 41	+ 02	+ 20
1970 from 1956-62 average:		+ 27	- 25	- 04

TABLE B-28.--Southern Manitoba - 10 year trend in waterfowl breeding population indexes by species, 1961-1970

(Index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Ducks:										
Dabblers:										
Mallard	211.1	129.2	182.0	167.0	147.0	192.1	193.0	133.4	158.5	189.1
Black duck	--	--	1.4	.2	--	.1	--	.5	--	.1
Gadwall	9.9	9.2	14.3	10.8	8.0	14.8	21.3	14.0	7.3	12.9
American widgeon	19.6	10.8	15.2	20.0	23.2	24.1	30.7	23.5	24.5	11.8
Green-winged teal	5.3	.4	4.7	.3	3.1	3.7	5.7	4.5	14.3	7.6
Blue-winged teal	84.1	43.9	47.0	38.2	32.5	26.1	60.2	33.6	46.8	80.4
Shoveler	38.6	17.4	33.3	38.0	32.2	28.9	42.5	22.9	41.1	40.1
Pintail	43.3	41.3	61.7	41.6	51.2	38.6	57.1	20.3	63.9	68.5
Subtotal	411.9	252.2	359.6	316.1	297.2	328.4	410.5	252.7	356.4	410.5
Divers:										
Redhead	9.9	13.5	33.8	31.9	45.4	43.3	29.4	16.0	22.1	24.4
Canvasback	31.3	23.0	30.5	38.0	40.7	37.3	33.8	18.1	28.0	20.5
Scaup	114.8	76.1	55.7	72.3	67.1	72.9	79.5	55.9	41.3	70.8
Ring-necked	5.5	2.4	6.8	1.8	2.9	.5	4.1	1.6	1.5	2.4
Goldeneye	3.9	2.9	1.1	1.8	3.7	.5	4.7	1.5	1.6	3.8
Bufflehead	3.3	1.5	5.4	3.9	7.8	6.2	12.3	4.5	10.0	3.4
Ruddy	18.3	8.2	14.6	11.6	13.6	19.8	14.2	16.2	8.4	13.1
Subtotal	187.0	127.6	147.9	161.3	181.2	180.5	178.0	113.8	112.9	138.4

TABLE B-28.--Southern Manitoba - 10-year trend in waterfowl breeding population indexes by species, 1961-1970--continued

(Index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Miscellaneous:										
Scoter	1.5	--	.4	.6	1.0	1.8	1.6	.2	--	.2
Merganser	.1	--	--	4.0	3.2	2.0	--	.2	.3	1.7
Subtotal	1.6	--	.4	4.6	4.2	3.8	1.6	.4	.3	1.9
Total ducks	600.5	379.8	507.9	482.0	482.6	512.7	590.1	366.9	469.6	550.8
Coots:	80.4	34.0	54.4	56.2	36.3	26.5	35.2	44.3	55.3	93.9
Grand total	680.9	413.8	562.3	538.2	518.9	539.2	625.3	411.2	524.9	644.7

TABLE B-29.--Southern Manitoba - comparative status of waterfowl breeding population indexes by species and stratum, 1970

(Index numbers in thousands)

Species	1970 Stratum 24(A)	1970 Stratum 25(B)	Totals (strata 24 & 25 combined) 1969	Totals (strata 24 & 25 combined) 1970	Average 1956-62	Percent change from: 1969	Percent change from: 1956-62 average
Ducks:							
Dabblers:							
Mallard	85.5	103.6	158.5	189.1	354.1	+ 19	- 47
Black duck	--	.1	--	.1	.1		No change
Gadwall	8.1	4.8	7.3	12.9	6.6	+ 77	+ 95
American widgeon	4.8	7.0	24.5	11.8	25.7	- 52	- 54
Green-winged teal	4.0	3.6	14.3	7.6	3.7	- 47	+105
Blue-winged teal	49.2	31.2	46.8	80.4	88.0	+ 72	- 09
Shoveler	22.7	17.4	41.1	40.1	34.6	- 02	+ 16
Pintail	33.6	34.9	63.9	68.5	78.2	+ 07	- 12
Wood duck	--	--	--	--	--	--	--
Subtotal	207.9	202.6	356.4	410.5	591.0	+ 15	- 31
Divers:							
Redhead	11.7	12.7	22.1	24.4	19.7	+ 10	+ 24
Canvasback	10.5	10.0	28.0	20.5	34.2	- 27	- 40
Scaup	36.5	34.3	41.3	70.8	70.3	+ 71	+ 01
Ring-necked duck	2.1	.3	1.5	2.4	5.6	+ 60	- 57
Goldeneye	.3	3.5	1.6	3.8	4.7	+138	- 19
Bufflehead	1.9	1.5	10.0	3.4	2.7	- 66	+ 26
Ruddy duck	4.5	8.6	8.4	13.1	9.7	+ 56	+ 35
Subtotal	67.5	70.9	112.9	138.4	146.9	+ 23	- 06

TABLE B-29.--Southern Manitoba - comparative status of waterfowl breeding population indexes by species and stratum, 1970--continued

(Index numbers in thousands)

Species	1970 Stratum 24(A)	1970 Stratum 25(B)	Totals (strata 24 & 25 combined) 1969	Totals (strata 24 & 25 combined) 1970	Average 1956-62	Percent change from: 1969	Percent change from: 1956-62 average
Miscellaneous:							
Scoter	--	.2	.3	.2	.7	- 33	- 71
Merganser	.3	1.4	--	1.7	--	+	+
Other	--	--	--	--	--	--	--
Subtotal	.3	1.6	.3	1.9	.7	+533	+171
Total ducks	275.7	275.1	469.6	550.8	738.7	+ 17	- 25
Geese:							
Canada goose	--	2.0	--	2.0	--	+	+
Coots:	67.2	26.7	55.3	93.9	76.4	+ 70	+ 23
Grand total	342.9	303.8	524.9	646.7	814.1	+ 23	- 21

TABLE B-30.--Southern Manitoba - lone drake index: Long-term trend expressed as a percentage of total drakes, 1953-70

Year	Mallard	Pintail	Canvasback	Percent lone drakes[1]
1953				70.1
1954				79.6
1955				87.5
1956	81.5	81.0	46.2	79.4
1957	91.2	85.5	68.5	88.9
1958	83.0	81.1	73.3	81.9
1959	71.8	69.7	41.7	70.0
1960	90.9	82.0	66.4	86.5
1961	71.5	65.0	33.7	67.5
1962	64.3	59.0	45.6	62.0
1963	85.2	80.7	79.0	83.7
1964	82.1	71.3	66.3	78.0
1965	79.1	63.6	68.0	73.8
1966	87.3	74.3	81.2	84.6
1967	86.7	74.6	78.6	83.4
1968	73.4	66.0	73.4	72.5
1969	89.6	84.6	93.4	91.3
1970	82.4	72.6	79.1	79.8

[1] Lone drakes include only mallards, pintails, and canvasback.

TABLE B-31.--Southern Manitoba - long-term trend in waterfowl brood and late-nesting indexes by species, July 1961-1970

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Broods:										
Duck brood index	35.7	15.6	32.3	25.2	21.7	30.6	32.1	14.7	24.0	22.3
Average brood size[1]	5.5	5.3	5.4	5.0	5.6	5.3	5.1	4.7	6.1	5.7
Coot brood index	4.4	5.1	3.5	12.8	15.8	8.9	13.0	3.0	16.4	14.1
Late-nest index:[2]										
Dabblers:										
Mallard	7.7	6.2	13.3	9.0	12.2	6.8	6.2	4.2	13.2	13.8
Gadwall	.9	1.8	2.1	.7	1.1	.4	1.7	1.1	1.2	1.2
American widgeon	2.7	--	4.3	1.2	5.1	1.4	4.9	.6	1.1	1.7
Green-winged teal	.1	--	.2	.1	.9	.3	.1	--	1.5	.4
Blue-winged teal	1.6	2.8	2.6	5.3	2.3	2.5	2.5	4.2	5.1	5.1
Shoveler	.3	--	.2	5.5	1.3	.7	.4	.3	2.1	.8
Pintail	1.6	.2	2.2	.3	.7	2.4	.6	.1	1.4	2.7
Subtotal	14.9	11.0	24.9	22.1	23.6	14.5	16.4	10.5	25.6	25.7
Divers:										
Redhead	1.2	.1	.7	1.8	1.0	1.5	.8	.3	1.9	1.9
Canvasback	.9	--	1.1	.3	.4	.3	.8	.3	.1	.3
Scaup	3.4	.7	1.7	2.5	3.4	1.3	1.6	1.9	3.0	2.0
Ring-necked duck	.6	.7	.2	--	.1	--	.1	--	.1	--
Goldeneye	.1	--	.2	.1	--	.7	--	--	--	--
Bufflehead	.5	--	.2	.1	.1	--	--	--	--	--
Ruddy duck	1.0	2.4	8.0	6.3	5.0	8.3	3.8	.6	6.3	5.3
Subtotal	7.7	3.9	12.1	11.1	10.0	12.1	7.1	3.1	11.4	9.5

TABLE B-31.--Southern Manitoba - long-term trend in waterfowl brood and late-nesting indexes by species, July 1961-1970--continued

(index numbers in thousands)

Species	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Miscellaneous ducks:	1.2	--	--	.1	.2	--	--	--	--	--
Total	23.8	14.9	37.0	33.3	33.8	26.6	23.5	13.6	37.0	35.2

[1] Class II and III broods only.
[2] As indicated by adult pairs and singles.

TABLE B-32.--Southern Manitoba - waterfowl brood and late-nesting indexes by stratum compared to previous year and 1956-62 average, 1970

(index numbers in thousands)

Species	1969 Stratum 24(A)	1969 Stratum 25(B)	1970 Stratum 24(A)	1970 Stratum 25(B)	Totals Strata A and B combined 1969	Totals Strata A and B combined 1970	1956-62 Average	Percent change from: 1969	Percent change from: 1956-62 average
Broods:									
Duck brood index	7.1	16.9	9.1	13.2	24.0	22.3	37.5	- 7	- 41
Average brood size[1]	6.2	5.9	5.8	5.7	6.1	5.7	5.7	- 5	NC
Coot brood index	5.6	10.8	7.4	6.7	16.4	14.1	8.7	- 14	+ 62
Late nesting index:[2]									
Dabblers:									
Mallard	8.2	5.0	6.9	6.9	13.2	13.8	15.5	+ 5	- 11
Gadwall	1.2	--	.8	.4	1.2	1.2	1.0	NC	+ 20
American widgeon	1.1	--	.2	1.5	1.1	1.7	2.9	+ 54	- 41
Green-winged teal	.8	.7	.4	--	1.5	.4	.6	- 73	- 33
Blue-winged teal	4.4	.7	3.1	2.0	5.1	5.1	8.8	NC	- 42
Shoveler	1.4	.7	.4	.4	2.1	.8	.8	- 62	NC
Pintail	.7	.7	1.6	1.1	1.4	2.7	2.6	+ 93	+ 4
Subtotal	17.8	7.8	13.4	12.3	25.6	25.7	32.0	NC	- 20
Divers:									
Redhead	1.2	.7	.8	1.1	1.9	1.9	1.4	NC	+ 36
Canvasback	.1	--	.3	--	.1	.3	1.0	+200	- 70
Scaup	1.9	1.1	1.6	.4	3.0	2.0	4.1	- 33	- 51
Ring-necked duck	.1	--	--	--	.1	--	.6	--	--
Goldeneye	--	--	--	--	--	--	.3	NC	NC
Bufflehead	--	--	--	--	--	--	.6	NC	--
Ruddy duck	3.1	3.2	4.0	1.3	6.3	5.3	4.0	- 16	+ 33
Subtotal	6.4	5.0	6.7	2.8	11.4	9.5	12.0	- 17	- 21
Miscellaneous ducks:	--	--	--	--	--	--	.3	--	--
Total	24.2	12.8	20.1	15.1	37.0	35.2	44.3	- 5	- 21

1 Class II and III broods only.

2 As indicated by adult pairs and singles.

TABLE B-33.--Montana - long-term trend in pond indexes by strata with comparisons to average and previous year, May and July 1965-1970

(index numbers in thousands)

	Year	Stratum 40			Stratum 41			Total
		Stock dam	Pothole	Stream	Stock dam	Pothole	Stream	
May:	1965	46.9	16.8	47.4	23.1	54.3	36.1	224.6
	1966	33.9	3.8	59.9	30.0	33.6	46.0	207.2
	1967	25.3	5.2	45.0	19.0	41.7	31.6	167.8
	1968	21.1	5.7	37.7	15.8	16.6	21.4	118.2
	1969	48.2	9.2	54.4	36.3	51.7	55.2	255.1
	1970	50.4	17.3	77.8	29.2	44.0	41.3	260.0
Average all water areas 1965-69:				194.6				
Percent change from 1969:				1.9				
Percent change from average:				33.5				
July:	1966	19.9	1.4	41.7	14.8	10.3	37.6	125.7
	1967	26.5	3.5	37.4	15.9	12.5	28.1	123.9
	1968	23.5	3.0	31.0	16.3	6.2	20.0	100.3
	1969	35.3	5.0	52.2	27.9	16.2	48.3	184.9
	1970	37.3	6.9	33.6	27.5	12.8	19.7	137.8
Average all water areas 1965-69:				133.7				
Percent change from 1969:				-25				
Percent change from average:				3				

TABLE B-34.--Montana - trend in waterfowl breeding population indexes by species, 1965-1970

(index numbers in thousands)

Species	1965	1966	1967	1968	1969	1970
Ducks:						
Dabblers:						
Mallard	233.2	362.8	172.7	126.0	166.1	184.7
Gadwall	52.1	60.0	35.8	38.0	35.0	20.8
American widgeon	24.7	29.7	38.1	47.9	53.3	58.5
Green-winged teal	7.7	10.2	11.7	10.9	3.4	10.9
Blue-winged teal	29.4	33.2	17.6	13.8	33.0	23.4
Shoveler	29.7	24.6	33.6	28.6	36.3	25.6
Pintail	163.3	162.5	128.3	44.4	76.5	102.9
Subtotal	540.1	683.0	437.8	309.6	403.6	426.9
Divers:						
Redhead	2.0	4.5	9.4	1.6	2.8	1.6
Canvasback	2.0	.5	1.7	2.6	3.4	2.7
Scaup	10.6	17.1	21.6	13.1	31.2	24.3
Ring-necked duck	--	--	3.5	1.4	.3	--
Goldeneye	--	--	--	--	.9	--
Bufflehead	--	--	.1	1.0	1.5	.1
Ruddy duck	--	--	.9	1.2	12.5	.4
Subtotal	14.6	22.1	37.2	20.9	52.6	29.0
Miscellaneous:						
Scoter	--	--	--	--	--	--
Merganser	--	--	--	--	--	--
Other	2.4	3.5	3.2	.4	--	--
Total ducks	557.1	708.6	478.2	331.1	456.2	455.9
Geese:						
Canada goose	--	--	7.3	5.5	8.4	10.4
Coots:						
American coot	--	--	6.0	15.4	8.0	6.3
Grand total	557.1	708.6	491.7	351.9	472.6	472.6

TABLE B-35.--Montana - comparative status of waterfowl breeding population indexes by species and stratum, 1970

(index numbers in thousands)

Species	Stratum 40	Stratum 41	Total 1969	Total 1970	1965-69 Average	Percent change from: 1969	Percent change from: average
Ducks:							
Dabblers:							
Mallard	71.6	113.1	166.1	184.7	212.2	+ 11	- 13
Gadwall	6.2	14.6	33.0	20.8	44.2	- 37	- 53
American widgeon	22.3	36.2	53.3	58.5	38.7	+ 10	+ 51
Green-winged teal	7.9	3.1	3.4	11.0	8.8	+221	+ 24
Blue-winged teal	7.6	15.9	33.0	23.5	5.4	- 29	+333
Shoveler	6.9	18.7	36.3	25.6	30.6	- 29	- 16
Pintail	14.0	88.9	76.5	102.9	115.0	+ 35	- 11
Subtotal	136.5	290.5	403.6	426.0	474.8	+ 6	- 10
Divers:							
Redhead	.9	.7	2.8	1.6	4.1	- 43	- 60
Canvasback	.2	2.5	3.4	2.7	2.0	- 21	+ 35
Scaup	4.3	19.9	31.2	24.2	18.7	- 22	+ 34
Ring-necked	--	--	.3	--	1.0	--	--
Goldeneye	--	--	.9	--	.2	--	--
Bufflehead	--	.1	1.5	.1	.5	- 93	- 80
Ruddy duck	.2	.1	12.5	.3	2.9	- 97	- 87
Subtotal	5.7	23.3	52.6	28.9	29.5	- 45	- 2
Miscellaneous:							
Other	--	--	--	--	1.9	--	--
Total ducks	142.2	313.7	456.2	455.9	506.2	NC	- 10
Geese:							
Canada goose	1.1	9.2	8.4	10.3	4.2	+ 24	+150
Coots:	2.3	3.9	8.0	6.2	5.9	- 21	+ 7
Grand total	145.6	326.8	472.6	472.4	516.4	NC	- 9

TABLE B-36.--Montana - lone drake index: long-term trend expressed as a percentage of total drakes, 1965-1970

Year	Mallard	Pintail	Total
1965	69.7	76.1	72.3
1966	79.1	85.9	81.2
1967	78.4	87.2	82.4
1968	72.0	83.7	75.2
1969	66.3	69.4	62.7
1970	74.5	82.4	77.5

TABLE B-37.--Montana - waterfowl brood and late-nesting indexes by stratum compared to previous year and 1965-69 average, 1970

(index numbers in thousands)

Species	Stratum 40	Stratum 41	Total 1969	Total 1970	Average 1965-69	Percent change from: 1969	Percent change from: average
Broods:							
Duck brood index	17.56	28.72	67.50	46.28	55.23	- 31	- 16
Average brood size[1]	5.37	5.36	5.33	5.36	4.98	1	7
Coot brood index	.22	.13	.38	.35	.38	- 8	- 8
Late-nesting index[2]							
Dabblers:							
Mallard	.33	.33	12.30	.66			
Gadwall	.33	.27	1.26	.60			
American widgeon	.44	.07	3.81	.51			
Green-winged teal	--	--	--	--			
Blue-winged teal	--	.60	3.17	.60			
Shoveler	.78	.40	.76	1.18			
Pintail	.56	.60	1.53	1.16			
Subtotal	2.44	2.27	22.83	4.71	13.75	- 79	- 66
Divers:							
Redhead	--	--	--	--			
Canvasback	--	.33	--	.33			
Scaup	--	.33	.24	.33			
Ring-necked duck	--	--	--	--			
Goldeneye	--	--	--	--			
Bufflehead	--	--	--	--			
Ruddy duck	--	.13	--	.13			
Subtotal	--	.79	.24	.79	.50		
Total ducks	2.44	3.06	23.07	5.50	14.25	- 76	- 62
Coots:	--	--	--	--	1.09		

[1] Class II and III broods only.
[2] As indicated by adult pairs and singles.

TABLE B-38.--Montana - Canada goose population surveys, 1969-1970

Unit	1969				1970			
	P	S	G	T	P	S	G	T
Nesting Survey								
Hi-Line	858	149	26	1,891	871	151	58	1,951
South Valley Co.	30	8	--	68	31	5	--	67
South Central	222	137	100	681	146	81	69	442
East Slope	158	41	18	375	165	57	59	446
Helena	65	37	39	206	91	20	38	240
Upper Missouri	137	84	62	420	106	55	136	403
Flathead	--	--	--	--	111	63	152	437
Production Survey								
Hi-Line	147	998	2,259	3,404	214	604	1,194	2,012
South Valley Co.	100	16	38	154	194	2	3	199
East Slope	858	160	416	1,434	688	173	418	1,295
Helena	57	134	353	544	34	84	176	294

P = pairs
S = subadults
G = goslings
T = total geese

TABLE B-39--North Dakota - long-term trend in pond indexes by strata and comparisons to average and previous years, May and July, 1970

(index numbers in thousands)

Year	Strata 29	Strata 30	Strata 31	Total
May:				
1960	8.5	325.2	23.8	357.5
1961	8.6	61.5	15.0	85.1
1962	15.6	218.0	32.6	266.2
1963	15.5	337.7	70.5	423.7
1964	9.3	148.6	34.8	192.7
1965	12.4	299.4	74.1	385.9
1966	32.7	428.1	79.9	540.7
1967	24.6	469.1	59.3	553.0
1968	9.9	272.2	63.9	346.0
1969	28.3	486.5	105.9	620.7
1970	26.1	586.4	120.1	732.6
Average 1960-1969				377.2
Percent change 1970 from average				+ 94.2
Percent change 1970 from 1969				+ 18.0
July:				
1960	7.8	109.8	17.5	135.1
1961	NA	NA	NA	NA
1962	7.0	116.1	45.1	168.2
1963	7.8	170.5	NR	178.3
1964	10.1	165.2	51.3	226.6
1965	NA	NA	NA	NA
1966	21.7	392.6	112.5	526.8
1967	14.9	221.5	46.9	283.3
1968	18.3	220.3	42.8	281.4
1969	18.1	426.9	86.7	531.7
1970	18.6	339.5	55.8	413.9
Average 1960-1969				307.6
Percent change 1970 from average				+ 34.6
Percent change 1970 from 1969				- 22.1

NA-NR - Years 1961, 1963, 1965 not included in average (either no data in files or survey not complete - Stratum 31 not run)

TABLE B-40--South Dakota - long-term trend in pond indexes by strata and comparisons to average and previous years, May and July, 1970

(index numbers in thousands)

Year	Strata			Total
	32	33	34	
May:				
1960	85.3	109.3	52.6	247.2
1961	45.8	49.5	32.6	127.9
1962	127.9	155.9	71.7	355.5
1963	143.0	146.1	79.9	369.0
1964	78.4	81.8	60.3	220.5
1965	82.2	105.0	84.0	271.2
1966	116.7	147.1	90.5	354.3
1967	45.5	155.7	190.1	391.3
1968	83.8	151.9	70.0	305.7
1969	151.5	275.2	151.2	577.9
1970	79.9	192.4	157.1	429.4
Average 1960-1969			315.4	
Percent change 1970 from average			+ 36.1	
Percent change 1970 from 1969			- 25.6	
July:				
1960	53.3	59.5	40.4	153.2
1961	25.7	31.2	27.3	84.2
1962	118.6	122.7	67.7	309.0
1963	92.8	121.3	98.6	312.7
1964	57.7	77.1	69.7	204.5
1965	NA	NA	NA	NA
1966	99.1	165.0	128.8	392.9
1967	77.1	144.9	115.8	337.8
1968	65.6	93.7	55.3	214.6
1969	103.0	199.5	87.7	390.2
1970	71.4	101.7	77.8	250.9
Average 1960-1969			266.6	
Percent change 1970 from average			- 5.9	
Percent change 1970 from 1969			- 35.7	

NA - Not Available

TABLE B-41.--North Dakota - 10-year trend in waterfowl breeding population indexes by species, 1970
(index numbers in thousands)

Species	1960	1961	1962	1963	1964	1965	1966	1967[11]	1968	1969	1970
Ducks:											
Dabblers:											
Mallard	96.3	83.5	80.1	302.7	134.1	176.9	193.4	275.5	114.0	202.8	299.9
Gadwall	28.4	21.4	49.9	35.6	31.4	79.9	114.2	154.8	96.5	97.4	100.7
American widgeon	6.0	1.4	1.3	4.0	1.7	--	4.8	13.6	4.9	18.6	14.1
Green-winged teal	--	1.4	1.6	--	--	--	11.0	10.0	2.2	11.7	29.2
Blue-winged teal	53.6	32.8	71.3	111.5	81.6	123.1	102.9	140.9	85.2	146.1	105.4
Shoveler	39.9	23.0	46.5	75.8	28.3	66.8	58.2	91.5	37.3	103.3	100.8
Pintail	123.7	55.7	75.5	113.7	54.7	127.4	85.1	155.4	48.0	150.0	301.8
Subtotal	347.9	219.2	326.2	643.3	331.7	574.1	569.6	841.7	388.1	729.9	951.9
Divers:											
Redhead	15.0	5.7	13.0	28.5	15.4	26.9	34.9	25.2	17.4	39.2	34.8
Canvasback	8.9	2.2	1.3	14.5	15.4	13.1	32.7	16.1	9.9	32.6	16.0
Scaup	20.9	9.4	33.6	13.7	.9	11.0	8.0	10.9	8.9	18.9	16.9
Ring-necked duck	.4	--	--	1.1	--	--	1.0	--	--	.3	1.3
Goldeneye	--	--	--	--	--	--	.3	--	--	--	--
Bufflehead	--	--	--	--	--	--	--	--	--	--	.8
Ruddy duck	11.3	4.8	4.6	8.3	1.7	3.1	7.7	9.3	5.7	12.2	18.7
Subtotal	56.5	22.1	52.5	66.1	33.4	54.1	84.6	61.5	41.9	103.2	88.5
Merganser	--	--	--	--	--	--	--	--	--	1.5	--
Total ducks	404.4	241.3	378.7	709.4	365.1	628.2	654.2	903.2	430.0	834.6	1040.4
Geese:											
Canada geese	--	--	--	--	--	--	--	--	--	--	--
Coots:											
American coot	51.9	28.6	56.7	60.1	7.4	68.4	94.9	91.6	92.1	51.6	71.9
Grand Total	456.3	269.9	435.5	769.5	372.5	696.6	749.1	994.8	522.1	886.2	1112.3

[11]From 1968 report

TABLE B-42--South Dakota - 10-year trend in waterfowl breeding population indexes by species, 1970
(index numbers in thousands)

Species	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Ducks:											
Dabblers:											
Mallard	87.6	127.1	190.0	280.5	158.0	154.5	112.0	146.9	158.1	208.7	195.9
Gadwall	3.9	9.6	27.5	76.4	23.4	48.3	54.2	50.3	62.6	77.2	62.2
American widgeon	4.0	4.5	3.7	.9	2.3	--	4.0	20.3	12.3	17.2	11.9
Green-winged teal	--	.7	2.5	.9	--	--	1.9	3.6	6.7	6.5	25.0
Blue-winged teal	66.3	82.4	81.5	191.0	128.8	124.4	80.7	47.5	65.5	127.1	110.4
Shoveler	39.5	29.4	100.5	74.9	34.2	29.0	29.7	24.7	38.6	70.1	63.7
Pintail	75.0	57.0	159.0	77.3	33.4	47.7	52.0	71.2	42.9	91.9	133.0
Subtotal	276.3	310.7	564.7	701.9	380.1	403.9	334.5	364.5	286.7	598.7	602.1
Divers:											
Redhead	6.0	3.4	13.6	13.6	13.0	16.6	13.0	3.9	7.1	17.3	11.0
Canvasback	1.0	2.4	1.8	2.5	4.8	2.2	4.1	2.5	1.0	10.4	3.9
Scaup	10.4	7.1	11.7	18.9	1.1	19.7	17.6	5.9	11.7	7.2	41.0
Ring-necked duck	--	--	--	.6	--	--	.9	.6	--	--	.8
Goldeneye	--	--	--	--	--	--	--	--	--	--	--
Bufflehead	--	--	--	--	--	--	.2	.6	--	--	--
Ruddy duck	2.4	1.3	2.2	2.7	.8	.4	2.1	--	3.3	1.8	9.1
Subtotal	19.8	14.2	29.3	38.3	19.7	38.9	37.9	13.5	23.9	36.7	65.8
Merganser	--	--	--	--	--	--	.6	--	--	--	--
Total ducks	296.1	324.9	594.0	740.2	399.8	442.8	373.0	378.0	410.6	635.4	667.9
Geese:											
Canada geese	--	--	--	--	--	--	.4	.2	--	--	.2
Coots:											
American coot	27.9	14.9	32.4	28.7	19.9	18.5	28.1	13.1	57.8	36.0	35.7
Grand Total	324.0	339.8	626.4	768.9	429.7	461.3	401.5	391.3	468.4	671.4	703.8

TABLE B-43.--North Dakota - comparative status of waterfowl breeding population indexes by species and stratum, 1970

(index numbers in thousands)

Species	Strata			Total		Average	Percent Change from	
	29	30	31	1970	1969	1960-69	1969	Average
Ducks:								
Dabblers:								
Mallard	7.6	245.6	46.7	299.9	202.8	165.9	+ 47.9	+ 80.8
Gadwall	1.9	96.9	1.9	100.7	97.4	70.9	+ 3.4	+ 42.0
American widgeon	.3	6.3	7.5	14.1	18.6	5.6	- 24.2	+151.8
Green-winged teal	.8	24.9	3.5	29.2	11.7	3.8	+149.6	+668.4
Blue-winged teal	3.3	92.3	9.8	105.4	146.1	94.9	- 27.8	+ 11.1
Shoveler	1.1	83.8	15.9	100.8	103.3	57.1	- 2.4	+ 76.5
Pintail	5.7	240.5	55.6	301.8	150.0	98.9	+101.2	+205.1
Subtotal	20.7	790.3	140.9	951.9	729.9	497.1	+ 30.4	+91.5
Divers:								
Redhead	--	34.8	--	34.8	39.2	22.1	- 11.2	+ 57.5
Canvasback	.5	15.5	--	16.0	32.6	14.7	- 50.9	+ 8.8
Scaup	.3	14.5	2.1	16.9	18.9	13.6	- 10.6	+ 24.3
Ring-necked duck	.3	1.0	--	1.3	.3	.3	+ 33.3	+ 33.3
Goldeneye	--	--	--	--	--	--	--	--
Bufflehead	.5	.3	--	.8	--	--	--	--
Ruddy duck	--	18.7	--	18.7	12.2	6.9	+ 53.3	+171.0
Subtotal	1.6	84.8	2.1	88.5	103.2	57.6	- 14.2	+ 53.6
Scoter	--	--	--	--	--	--	--	--
Merganser	--	--	--	--	1.5	.2	--	--
Total ducks	22.3	875.1	143.0	1040.4	834.6	554.9	+ 24.6	+ 87.5
Geese:								
Canada geese	--	--	--	--	--	--	--	--
Coots:								
American coot	1.7	61.8	8.4	71.9	51.6	60.3	+39.3	+ 19.2
Grand Total	24.0	936.9	151.4	1112.3	886.2	615.2	+25.5	+ 80.8
Ponds	26.1	586.4	120.1	732.6	620.7	377.2	+18.0	+ 94.2

TABLE B-44--South Dakota - comparative status of waterfowl breeding population indexes by species and stratum, 1970

(Index numbers in thousands)

Species	Strata			Total		Average	Percent Change from	
	32	33	34	1970	1969	1960-69	1969	Average
Ducks:								
Dabblers:								
Mallard	34.3	90.8	70.8	195.9	208.7	163.3	- 6.1	+ 20.0
Gadwall	3.9	42.4	15.9	62.2	77.2	43.3	- 19.4	+ 43.6
American widgeon	1.3	1.1	9.5	11.9	17.2	6.9	- 30.8	+ 72.5
Green-winged teal	2.3	18.5	4.2	25.0	6.5	2.3	+284.6	+986.9
Blue-winged teal	13.9	84.4	12.1	110.4	127.1	99.5	- 13.1	+ 10.9
Shoveler	8.7	42.3	12.7	63.7	70.1	47.1	- 9.1	+ 35.2
Pintail	25.9	80.1	27.0	133.0	91.9	70.1	+ 44.8	+ 89.7
Subtotal	90.3	359.6	152.2	602.1	598.7	432.5	+ 0.6	+ 39.2
Divers:								
Redhead	2.5	8.5	--	11.0	17.3	10.7	- 36.4	+ 2.8
Canvasback	--	3.5	.4	3.9	10.4	3.3	- 62.5	+ 18.2
Scaup	5.1	28.4	7.5	41.0	7.2	11.1	+469.4	+269.4
Ring-necked duck	--	.8	--	.8	--	.2	--	+300.0
Goldeneye	--	--	--	--	--	--	--	--
Bufflehead	--	--	--	--	--	--	--	--
Ruddy duck	--	7.6	1.5	9.1	1.8	1.7	+405.5	+435.3
Subtotal	7.6	48.8	9.4	65.8	36.7	27.0	+ 75.0	+143.7
Scoter	--	--	--	--	--	--	--	--
Merganser	--	--	--	--	--	Tr	--	--
Total ducks	97.9	408.4	161.6	667.9	635.4	459.5	+ 5.1	+ 45.3
Geese:								
Canada geese	--	.2	--	.2	--	Tr	--	--
Coots:								
American coot	3.0	30.9	1.8	35.7	36.0	28.7	- 0.8	+ 24.4
Grand Total	100.9	439.5	163.4	703.8	671.4	488.2	+ 4.8	+ 44.2
Ponds	79.9	192.4	157.1	429.4	577.9	315.4	- 25.6	+ 36.1

TABLE B-45.--North Dakota - lone drake index: long-term trend expressed as a percentage of total drakes, 1960-70

Year	Mallard	Pintail	Canvasback	Total
1960	78.67	81.94	42.10	79.36
1961	66.11	80.83	100.00	72.52
1962	60.35	83.75	100.00	71.43
1963	72.40	76.76	73.07	73.69
1964	79.02	82.40	83.33	80.26
1965	73.18	80.66	67.65	76.31
1966	69.76	68.63	76.67	69.47
1967	78.65	78.33	76.19	78.45
1968	71.76	69.67	67.74	70.94
1969	78.24	64.94	49.91	69.66
1970	83.69	85.18	74.03	84.17

TABLE B-46. --South Dakota - lone drake index: long-term trend expressed as a percentage of total drakes, 1960-70

Year	Mallard	Pintail	Canvasback	Total
1960	69.03	70.83	80.00	69.79
1961	56.79	76.75	59.97	62.93
1962	68.58	82.11	37.49	74.55
1963	81.44	80.93	33.33	80.78
1964	53.81	63.69	44.42	55.33
1965	71.98	81.72	75.00	73.31
1966	66.12	76.96	28.26	68.73
1967	64.08	85.88	54.17	70.81
1968	71.10	64.94	49.91	69.66
1969	66.99	76.73	74.13	68.18
1970	71.66	69.90	61.11	70.85

TABLE B-47.--North Dakota - waterfowl brood and late-nesting indexes by stratum and compared to previous years and the long-term average, 1970

/index numbers in thousands/

	Stratum			Total		Average	% Change from	
	29	30	31	1969	1970	1966-1969	1969	Average
Broods:								
Duck brood index	.3	43.9	11.2	50.7	55.4	46.9	+ 9.3	+ 18.1
Average brood size[1]	7.0	6.5	6.4	6.3	6.5	--	+ 3.1	
Coot brood index	.1	17.6	.5	13.9	18.2	14.1	+ 30.9	+ 29.1
Late-nesting index[2]								
Dabblers:								
Mallard	.9	17.6	.5	14.4	19.0	17.4	+ 31.9	+ 9.2
Gadwall	--	10.8	--	12.9	10.8	12.9	- 16.3	- 16.3
American widgeon	--	--	--	1.7	--	.8	--	
Green-winged teal	--	4.2	--	1.9	4.2	.8	+121.0	+425.0
Blue-winged teal	--	4.3	--	15.0	4.3	8.2	- 71.3	- 47.6
Shoveler	--	.3	--	1.0	.3	.8	- 70.0	- 40.0
Pintail	--	3.6	--	5.0	3.6	3.8	- 28.0	- 5.3
Subtotal	.9	40.8	.5	51.9	42.2	44.7	- 18.7	- 5.6
Divers:								
Redhead	--	2.2	--	2.1	2.2	1.2	+ 4.8	+ 83.3
Canvasback	--	--	--	--	--	--	--	--
Scaup	--	.3	.4	1.0	.7	.3	- 30.0	+433.3
Ring-neck	--	--	--	--	--	--	--	--
Goldeneye	--	--	--	--	--	--	--	--
Bufflehead	--	--	--	--	--	--	--	--
Ruddy	.9	8.3	--	6.8	9.2	6.3	+ 35.3	+ 46.0
Subtotal	.9	10.8	.4	9.9	12.1	7.8	+ 22.2	+55.1
Grand Total	1.8	51.6	.9	61.8	54.3	52.5	- 12.1	+ 3.4
Water	18.6	336.6	55.8	531.7	411.0	429.1	- 22.7	- 4.2

1 Class II and III broods only
2 As indicated by adult pairs and singles

TABLE B-48.--South Dakota - waterfowl brood and late-nesting indexes by stratum and compared to previous years and the long-term average, 1970

/index numbers in thousands/

	Stratum			Total		Average	% Change from	
	32	33	34	1969	1970	1966-1969	1969	Average
Broods:								
Duck brood index	3.3	25.2	11.8	43.4	40.3	30.5	- 7.1	+ 32.1
Average brood size[1]	5.5	6.1	4.5	5.6	5.5	--	- 1.7	
Coot brood index	.3	2.8	.2	5.4	3.3	3.6	- 38.9	- 8.3
Late-nesting index[2]								
Dabblers:								
Mallard	1.5	10.7	2.9	17.9	15.1	14.8	- 15.6	+ 2.0
Gadwall	.8	4.1	.6	13.4	5.5	9.0	- 58.9	- 38.9
American widgeon	--	.2	1.3	1.5	1.5	1.7	ND	- 11.8
Green-winged teal	.8	2.8	--	1.2	3.6	.4	+200.0	+800.0
Blue-winged teal	1.3	2.8	.7	10.5	4.8	5.7	- 54.3	- 15.8
Shoveler	--	.8	.6	1.5	1.4	.9	- 6.7	+ 55.5
Pintail	--	.8	.9	3.6	1.7	1.2	- 52.8	+ 41.6
Subtotal	4.4	22.2	7.0	49.6	33.6	33.7	- 32.3	NC
Divers:								
Redhead	--	1.1	--	1.4	1.1	.4	- 21.4	+175.0
Canvasback	--	--	--	--	--	.1	--	--
Scaup	.3	1.1	--	--	1.4	.2	--	+600.0
Ring-neck	--	--	--	--	--	--	--	--
Goldeneye	--	--	--	--	--	--	--	--
Bufflehead	--	--	--	--	--	--	--	--
Ruddy	.8	3.7	--	2.1	4.5	1.6	+114.3	+181.3
Subtotal	1.1	5.9	--	3.5	7.0	2.3	+100.0	+204.3
Grand Total	5.6	28.1	7.0	53.1	40.6	36.0	- 23.5	+ 12.8
Water	71.4	101.7	77.8	390.2	250.9	333.8	- 35.7	- 24.8

1 Class II and III broods only
2 As indicated by adult pairs and singles

TABLE B-49.--Minnesota - waterfowl breeding population indexes for selected areas, 1970

Species	Stratum[1] 1	2	3	4	State total
Ducks:					
Dabblers:					
Mallard	9,856	14,395	43,212	4,159	71,622
Gadwall	--	688	1,073	58	1,799
American widgeon	106	--	--	674	780
Green-winged teal	--	--	--	58	58
Blue-winged teal	5,280	7,346	19,056	1,289	32,971
Shoveler	528	816	2,013	381	3,738
Pintail	246	519	268	264	1,297
Wood duck	458	1,558	5,502	--	7,518
Subtotal	16,474	25,302	71,124	6,883	119,783
Divers:					
Redhead	2,006	1,484	1,208	264	4,962
Canvasback	1,795	297	1,745	--	3,837
Scaup[2]	3,098	2,968	6,039	3,163	15,268
Ring-necked duck	2,886	1,781	1,208	586	6,461
Ruddy duck	70	371	1,476	--	1,917
American goldeneye[3]	176	148	268	791	1,383
Bufflehead	--	148	--	--	148
Subtotal	10,031	7,197	11,944	4,804	33,976
Miscellaneous:					
Merganser - large	--	--	--	176	176
Total ducks	26,505	32,499	83,068	11,863	153,935
Coots:	3,062	6,381	12,212	88	21,743
Grand total	29,567	38,880	95,280	11,951	175,678

[1] The strata given here represent the following:
1 - High density of lake basins
2 - Medium density of lake basins
3 - Low density of lake basins
4 - Roseau and Red Lake bog region in northwestern Minnesota.

[2] Scaup are not considered resident breeding ducks.

[3] American goldeneyes tallied in strata 4 largely represent nonbreeders on large lakes.

TABLE B-50.--Minnesota - estimated number of breeding ducks adjusted for birds not seen by aerial crews in selected portions of Minnesota, 1970

Species	Unadjusted population index	Visibility rate	Adjusted population index	Percentage change from 1969
Mallard	71,622	58%	123,000	+ 22
Blue-winged teal	32,971	20%	164,000	+ 1
Ring-necked duck	6,461	54%	12,000	+ 24
All ducks	153,935	44%	350,000	- 5

TABLE B-51.--Chippewa National Forest, Minnesota - trend in waterfowl breeding populations by area, 1964-1970

Area	1964	1965	1966	1967	1968	1969	1970
Bowstring	245	301	178	138	277	217	294
Burns	109	87	93	114	41	119	149
Kitchie	204	162	160	163	200	252	207
Lower Pigeon	90	54	33	6	25	16	6
Mud Lake	141	150	170	--	120	110	136
Raven Lake	11	8	--	8	15	--	--
Round Lake	729	445	283	511	262	235	362
Third River	178	365	201	142	72	177	316
Winnibigoshish Lake	309	300	210	220	247	73	206
Rabideau	247	178	211	181	150	103	163
Total	2,263	2,050	1,539	1,483	1,409	1,302	1,839

TABLE B-52.--Chippewa National Forest, Minnesota - adult:juvenile ratios by species for all ducks, 1969-1970

Species	1969			1970		
	Adults	Juveniles	Ratio	Adults	Juveniles	Ratio
Mallard	155	431	1:2.7	245	560	1:2.3
American widgeon	35	78	1:2.2	86	124	1:1.4
Goldeneye	88	191	1:2.1	64	204	1:3.2
Blue-winged teal	27	30	1:1.1	36	74	1:2.0
Ring-necked duck	37	52	1:1.6	33	80	1:2.4
Wood duck	72	69	1:0.9	121	170	1:1.4
Other	19	18	1:0.9	12	30	1:2.5

TABLE B-53.--Washington - duck and coot breeding population indexes by species and region, 1969 and 1970

Species	Region				Total		Percent change
	W. Washington	Potholes	Irrigated	Highlands & misc.	1969	1970	
Ducks:							
Dabblers:							
Mallard	7,130	22,160	11,000	19,930	45,110	60,220	+ 33
Gadwall	--	9,800	1,230	620	1,760	11,650	+561
American widgeon	--	12,540	540	3,400	9,140	16,480	+ 80
Green-winged teal	290	11,600	540	2,370	4,500	14,800	+229
Blue-winged and cinnamon teal	430	23,420	8,450	12,790	29,130	45,090	+ 55
Shoveler	50	4,780	910	560	8,950	6,300	- 30
Pintail	20	10,050	490	1,590	10,690	12,150	+ 14
Wood duck	4,300	30	1,020	290	4,120	5,640	+ 37
Subtotal	12,220	94,380	24,180	41,550	113,400	172,330	+ 52
Divers:							
Redhead	--	9,070	4,300	2,250	11,400	15,620	+ 37
Canvasback	--	90	--	--	480	90	- 81
Scaup	--	9,220	290	4,860	9,860	14,370	+ 46
Ring-necked duck	--	680	--	2,790	1,590	3,470	+118
Goldeneye	--	270	--	4,810	3,600	5,080	+ 41
Bufflehead	20	90	--	620	50	730	+1,360
Ruddy duck	--	13,750	990	1,340	6,100	16,080	+164
Harlequin	--	10	--	--	--	10	--
Subtotal	20	33,180	5,580	16,670	33,080	55,450	+ 68

TABLE B-53.--Washington - duck and coot breeding population indexes by species and region, 1969 and 1970--continued

Species	Region				Total		Percent change
	W. Washington	Potholes	Irrigated	Highlands & misc.	1969	1970	
Ducks:							
Mergansers:							
American merganser	20	--	--	280	360	300	- 17
Hooded merganser	230	--	--	260	3,730	490	- 87
Subtotal	250	--	--	540	4,090	790	- 81
Total ducks	12,490	127,560	29,760	58,760	150,570	228,570	+ 52
Coots:	670	37,140	5,970	4,000	20,730	47,780	+130
Grand total	13,160	164,700	35,730	62,760	171,300	276,350	+ 61

TABLE B-54.--Washington - waterfowl production indexes, 1969 and 1970

Species	1969	1970	Percent change
Ducks:			
Dabblers:			
Mallard	116,300	165,200	+ 42
Gadwall	5,400	21,300	+294
American widgeon	28,700	58,500	+104
Green-winged teal	14,000	35,500	+154
Blue-winged and cinnamon teal	92,200	147,500	+ 60
Shoveler	27,800	56,000	+101
Pintail	33,200	69,000	+108
Wood duck	12,100	12,600	+ 4
Subtotal	329,700	565,600	+ 72
Divers:			
Redhead	33,500	60,100	+ 79
Canvasback	1,400	200	- 86
Scaup	21,100	40,200	+ 91
Ring-necked duck	5,600	8,600	+ 54
Goldeneye	12,700	14,800	+ 17
Bufflehead	100	700	+600
Ruddy duck	17,400	36,400	+109
Harlequin	--	Tr	--
Subtotal	91,800	161,000	+ 75
Mergansers:			
American merganser	1,100	1,000	- 9
Hooded merganser	5,100	2,000	- 61
Subtotal	6,200	3,000	- 52
Total ducks	427,700	729,600	+ 71
Geese:			
Canada goose	10,300	10,800	+ 5
Coots:	46,000	90,200	+ 96
Grand total	484,000	830,600	

TABLE B-55.--Oregon - duck production index by species, 1969 and 1970

Species	Number of young	
	1969	1970
Ducks:		
Dabblers:		
Mallard	1,333	953
Gadwall	651	528
American widgeon	74	39
Green-winged teal	46	57
Blue-winged & cinnamon teal	642	544
Shoveler	15	27
Pintail	151	164
Wood duck	151	217
Subtotal	3,063	2,529
Divers:		
Redhead	290	401
Canvasback	20	116
Scaup	--	7
Ruddy duck	60	139
Subtotal	370	663
Miscellaneous:		
Merganser	--	3
Unidentified	21	55
Subtotal	21	58
Total	3,454	3,250

TABLE B-56.--Oregon - goose production index, 1969 and 1970

Transect	Total broods		Total young	
	1969	1970	1969	1970
Klamath River	220	182	990	835
Sprague River	17	22	76	102
Nuss Lake	18	16	82	74
Agency Lake	11	13	48	62
Wocus Bay	35	29	159	130
Howard Bay	16	14	73	63
Summer Lake	45	57	193	288
N. Lake County	28	30	116	152
Columbia River	8	9	33	55
G. I. Ranch	29	30	139	148
Jefferson County	2	--	9	--
S. Lake County	28	37	117	183
Ladd Marsh	11	13	76	90
Howard Prairie	12	7	45	21
Hyatt Lake	7	--	41	--
Hanks Marsh	18	4	80	17
Malheur Refuge	219	304	985	1,400
Klamath Forest Refuge	68	39	308	181
Total	792	806	3,570	3,801

TABLE B-57.--Idaho - aerial counts of Canada geese on all major breeding areas, 1961-1970

Area	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1959-69 average	Percent change from: 1969	Percent change from: average
Snake River													
Farewell Bend to Walter's Ferry	1,223	1,420	1,351	1,748	1,331	1,270	1,771	1,599	1,132	1,105	1,392	- 2	- 21
Payette River (mouth to Emmett)	308	409	477	318	450	516	866	633	509	332	473	- 35	- 30
Strike Reservoir to American Falls	199	224	222	231	154	225	246	265	251	199	208	- 21	- 4
Island Park	473	329	451	419	408	330	344	178	178[1]	275	353	--	- 20
South Fork	222	143	239	158	225	251	217	208	220	226	206	+ 3	+ 10
Mud Lake - Camas NWR	313	297	210	186	216	171	180	NC	191	245	211	+ 28	+ 16
Grays Lake	596	516	814	872	799	538	696	620	620[1]	649	639	--	+ 2
Blackfoot Reservoir	580	395	587	562	418	377	554	645	645[1]	447	520	--	- 14
Bear River													
Dingle Marsh	1,418	1,077	2,225	1,605	1,950	1,758	1,528	1,243	1,243[1]	1,409	1,464	--	- 4
Total	5,332	4,810	6,576	6,099	5,951	5,436	6,402	5,391	4,989	4,887	5,466	- 2	- 11

[1] 1968 date used.

TABLE B-58.--Idaho - Canada goose production aummary and comparison, 1969-1970

	Southwest Units[1]					Southeast Units[2]					All Units Combined				
				Percent change from:					Percent change from:					Percent change from:	
	1969	1970	long-term average	1969	long-term average	1969	1970	long-term average	1969	long-term average	1969	1970	long-term average	1969	long-term average
Nests	277	340	340	+ 23	- 4	137	92	178	- 33	- 48	414	432	494	+ 4	- 13
Nests hatched	201	279	265	+ 39	+ 5	109	57	135	- 48	- 58	310	336	404	+ 8	- 17
Number hatch/ successful nest	5.1	5.3	5.2	+ 4	+ 2	4.2	4.3	4.6	+ 2	- 7	4.8	5.1	4.9	+ 6	+ 4
Goalings produced	1,019	1,486	1,372	+ 46	+ 8	454	247	623	- 46	- 60	1,473	1,733	1,995	+ 18	- 13

[1] Homedale and Payette.

[2] Blackfoot, Island Park Reservoir, North Fork, and North Lake.

[3] Long-term average from 1959-69, inclusive.

TABLE B-59.--California - waterfowl nesting pair index, 1969 and 1970

Species	Sacramento Valley		Suison Marsh		North San Joaquin Valley		South San Joaquin Valley		North-eastern California		Klamath Basin		Total	
	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970
Ducks:														
Dabblers:														
Mallard	25,480	37,960	1,360	1,570	2,580	1,720	2,080	1,180	4,900	6,990	640	610	37,040	50,030
Gadwall	240	1,000	160	430	800	850	170	30	1,290	1,120	520	520	3,180	3,950
Cinnamon teal	1,360	3,800	140	340	710	950	1,360	430	1,220	1,170	160	160	4,950	6,850
Shoveler	80	40	20	200	160	140	1,060	10	240	140	1,030	310	2,590	840
Pintail	520	400	60	240	120	170	2,440	90	2,930	2,350	460	150	6,530	3,400
Subtotal	27,680	43,200	1,740	2,780	4,370	3,830	7,110	1,740	10,580	11,770	2,810	1,750	54,290	65,070
Divers:														
Redhead	200	120	--	20	30	70	50	40	560	480	260	220	1,100	950
Scaup	--	--	--	--	--	--	--	--	100	80	300	70	400	150
Ruddy duck	360	--	30	60	30	110	300	10	130	130	420	270	1,270	580
Subtotal	560	120	30	80	60	180	350	50	790	690	980	560	2,770	1,680
Miscellaneous:	--	40	--	20	10	10	150	40	250	210	430	210	840	530
Total ducks	28,240	43,360	1,770	2,880	4,440	4,020	7,610	1,830	11,620	12,670	4,220	2,520	57,900	67,280
Canada goose:	--	--	--	--	--	--	--	--	830	1,130	640	460	1,470	1,590
Coot:	9,920	33,280	110	920	1,020	2,890	4,640	1,750	1,760	1,830	2,060	1,570	19,510	42,240

TABLE B-60.--California - waterfowl fall population index, 1969 and 1970

Species	Sacramento Valley		Suison Marsh		North San Joaquin Valley		South San Joaquin Valley		Northeastern California		Klamath Basin		Total	
	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970	1969	1970
Ducks:														
Dabblers:														
Mallard	106,420	158,540	4,680	6,520	7,500	5,570	5,920	3,260	31,810	45,410	4,900	4,200	161,230	223,500
Gadwall	1,200	5,000	800	2,140	2,490	2,660	520	60	10,170	8,830	3,750	4,630	18,930	23,320
Cinnamon teal	5,080	14,190	500	1,250	2,230	2,990	5,440	1,180	7,880	7,600	1,160	1,180	22,290	28,390
Shoveler	360	180	60	900	500	420	3,980	30	1,460	870	5,690	2,750	12,050	5,150
Pintail	2,000	1,540	210	920	350	530	8,050	240	16,800	13,470	3,140	740	30,550	17,440
Subtotal	115,060	179,450	6,250	11,730	13,070	12,170	23,910	4,770	68,120	76,180	18,640	13,500	245,050	297,800
Divers:														
Redhead	900	540	--	60	80	220	200	100	3,840	3,280	1,710	1,350	6,730	5,550
Scaup	--	--	--	--	--	--	--	--	620	480	1,810	480	2,430	960
Ruddy duck	1,610	--	120	240	70	290	1,430	10	720	740	3,300	2,290	7,250	3,570
Subtotal	2,510	540	120	300	150	510	1,630	110	5,180	4,500	6,820	4,120	16,410	10,080
Miscellaneous:	--	180	--	60	20	30	580	110	1,260	1,020	2,750	1,350	4,610	2,750
Total ducks	117,570	180,170	6,370	12,090	13,240	12,710	26,120	4,990	74,560	81,700	28,210	18,970	266,070	310,630
Canada goose:	--	--	--	--	--	--	--	--	15,820[1]	21,160[2]	4,460[3]	3,300[4]	20,280	24,460
Coot:	45,750	153,340	500	4,230	5,540	15,720	25,270	9,510	10,510	10,950	11,520	8,130	99,090	201,880

1 Includes 10,210 nonbreeders.
2 Includes 14,570 nonbreeders.
3 Includes 1,810 nonbreeders.
4 Includes 1,470 nonbreeders.

TABLE B-61. --Utah - waterfowl trend figures obtained from aerial surveys, 1966-1970

Route flows	Square miles sampled	Total ducks counted					Ducks per square mile				
		1966	1967	1968	1969	1970	1966	1967	1968	1969	1970
Box Elder County	48.0	2,797	2,843	2,943	3,509	3,614	58.3	59.2	61.3	73.1	75.3
Weber County	15.5	616	994	1,092	1,801	1,891	39.7	64.1	70.4	130.1	122.0
Davis County	14.2	774	1,004	1,007	1,410	1,520	54.4	70.7	70.9	100.7	107.4
Jordan River Clubs	6.2	173	643	560	714	903	27.9	103.7	90.3	119.0	145.6
Salt Lake County	6.7	24	104	163	676	540	3.6	15.5	24.3	112.7	80.6
Utah County	18.0	430	603	733	448	450	23.9	33.5	40.7	24.9	25.0
Total	108.6	4,814	6,191	6,498	8,558	8,919	23.9	57.0	59.8	79.2	82.1

TABLE B-63.--Utah - Canada geese production index, 1969-1970

Area	Number of breeding pairs		Number of young	
	1969	1970	1969	1970
Cutler Reservoir	40	20	210	103
Public shooting grounds	8	5	33	19
Bear River Refuge and vicinity	277	400	1,092	1,688
Ogden Bay Wildlife Management Area	61	28	246	125
Farmington Bay Wildlife Management Area	62	39	277	162
Scipio Reservoir	3	3	15	8
Remond Lake	7	7	33	44
Gunnison Reservoir	6	7	14	40
Clear Lake Wildlife Management Area	6	3	29	11
Mona Reservoir	4	5	16	24
Wales Reservoir	2	6	12	30
Rich County (Bear River)	69	29	344	192
Brown's Park Wildlife Management Area	23	22	115	63
Total	568	574	2,436	2,509

TABLE B-62.--Utah - Percentage species composition of breeding populations of waterfowl as determined from ground survey data, 1969-1970

Species	Northern Utah		Southern Utah	
	1969	1970	1969	1970
Ducks:				
Dabblers:				
Mallard	10.4	9.5	14.7	16.1
Gadwall	17.4	19.2	13.6	14.9
American widgeon	0.1	0.1	0.8	1.3
Green-winged teal	0.5	0.3	6.6	5.8
Blue-winged teal	0.3	0.3	0.7	1.3
Cinnamon teal	10.0	6.1	17.3	18.5
Shoveler	6.0	2.0	7.5	7.0
Pintail	7.1	1.4	9.7	11.2
Divers:				
Redhead	34.6	36.1	17.5	15.4
Canvasback	--	0.1	--	.1
Scaup	--	0.5	0.6	.4
Goldeneye	--	0.1	--	.1
Bufflehead	--	0.2	0.5	.1
Ruddy duck	14.6	4.1	10.5	7.7

TABLE B-64.--Utah - dike-line breeding pair counts of water on four State refuges, 1969 and 1970

Species	Ogden Bay		Farmington Bay		Public shooting grounds		Clear Lake	
	1969	1970	1969	1970	1969	1970	1969	1970
Ducks:								
Dabblers:								
Mallard	490	347	16	37	16	84	82	204
Gadwall	490	360	76	79	16	47	136	121
American widgeon	--	--	--	5	--	5	1	14
Green-winged teal	5	7	--	3	--	7	25	71
Blue-winged teal	18	17	--	6	11	3	7	23
Cinnamon teal	710	403	144	338	20	60	217	294
Shoveler	250	135	57	22	10	8	86	97
Pintail	290	222	44	34	11	19	54	144
Subtotal	2,253	1,491	337	524	84	233	608	968
Divers:								
Redhead	790	266	354	638	244	261	183	215
Canvasback	--	1	--	1	--	--	--	1
Scaup	--	--	--	--	--	--	1	2
Goldeneye	--	--	--	--	--	--	--	1
Ruddy duck	260	148	197	581	11	47	57	147
Subtotal	1,050	415	551	1,220	255	308	241	366
Total ducks	3,303	1,906	888	1,744	339	541	849	1,334
Geese:								
Canada goose	61	28	62	39	8	5	14	3

TABLE B-65.--Wyoming - trend in waterfowl breeding populations, 1967-1970

Species	1967	1968	1969	1970	Percent change from: 1969	Percent change from: average
Ducks:						
Dabblers:						
Mallard	120,139	168,669	160,547	101,095	- 7	- 13
Gadwall	33,510	39,806	9,518	40,048	+321	+158
American widgeon	11,205	30,032	16,234	74,607	+360	+537
Teal	41,968	34,070	31,812	105,467	+232	+346
Shoveler	16,068	14,196	17,912	16,693	- 7	+ 46
Pintail	17,810	30,904	22,660	23,825	+ 5	- 7
Subtotal	240,700	317,677	258,683	361,735		
Divers:						
Redhead	531	2,127	848	10,015	+1,081	+649
Canvasback	531	1,530	586	925	+ 58	+ 13
Scaup	2,271	5,570	3,978	7,968	+100	+305
Goldeneye	953	1,090	586	462	- 21	.- 26
Bufflehead	--	218	--	204	--	--
Ruddy duck	1,746	4,695	260	102	- 61	- 94
Subtotal	6,032	15,230	6,258	19,676		
Miscellaneous:						
Merganser	7,031	9,718	8,410	7,891	- 6	+ 43
Total ducks	253,763	342,625	273,351	389,302		
Coots:	5,759	14,472	13,799	14,120	+ 2	+139
Grand total	259,522	357,097	287,150	403,422		

TABLE B-66.--Wyoming - summary of Canada goose breeding pair surveys, 1962-1970

Drainage	1952-61 Average	1962	1963	1964	1965	1966	1967	1968	1969	1970	Percent change from: 1969	Percent change from: 1952-69 average
Snake River	361	270	441	379	493	553	503	554	463	638	+ 38	+ 58
Bear River	335	498	757	747	898	961	1,008	1,189	1,069	1,243	+ 16	+114
Green River	246	310	478	432	428	440	455	686	413	451	+ 9	+ 33
North Plattee River	235	241	312	348	360	310	410	416	589	607	+ 3	+102
Wind River	113	173	182	199	228	266	446	408	505	515	+ 2	+156
Big Horn River	--	--	25	40	44	41	106	118	163	168	+ 3	+118
Total	1,254	1,492	2,195	2,145	2,451	2,571	2,923	3,371	3,202	3,622	+ 13	+ 98

TABLE B-67.--Colorado - duck breeding population by species and the 16-year average for comparison, 1970

Species	Number of breeding pairs			Percent species composition		
	1969	1970	1954-69[1] Average	1969	1970	1954-69 Average
Ducks:						
Dabblers:						
Mallard	28,744	23,255	28,674	41.6	40.5	59.2
Gadwall	5,942	14,989	4,245	8.6	26.1	8.8
American widgeon	1,870	2,636	630	2.7	4.6	1.3
Green-winged teal	12,924	2,587	2,299	18.7	4.5	4.7
Blue-winged teal and cinnamon teal	9,302	4,893	4,554	13.5	8.5	9.4
Shoveler	2,750	3,461	1,845	4.0	6.0	3.8
Pintail	4,355	3,736	3,372	6.3	6.5	7.0
Subtotal	55,557	65,887	45,619			
Divers:						
Redhead	2,071	1,141	1,701	3.0	2.0	3.5
Others	1,067	691	1,135	1.6	1.2	2.3
Subtotal	3,138	1,832	2,836			
Total	69,025	57,389	48,455			

TABLE B-68.--Colorado - summary of duck breeding ground population estimates by area and the long-term average for comparison, 1970

Area	Total estimated breeding pairs			Percent change from:	
	1969	1970	long-term average[1]	1969	long-term average
San Luis Valley	27,425	27,059	27,529	- 1.3	- 1.7
North Park[2]	22,111	15,356	20,944	-30.6	-26.7
Cache la Poudre Valley	9,057	4,360	2,933	-51.9	+48.7
South Platte Valley	6,769	6,912	5,786	+ 2.1	+19.46
Yampa Valley	2,146	2,350	2,932	+ 9.5	-19.8
Brown's Park	1,517	1,352	974	-10.9	-38.8
Total	69,025	57,389	61,098	-16.9	- 6.1

1 San Luis Valley and North Park averages are based on results of 1964-68 and 1968-69 surveys respectively because of changes in survey methods utilized prior to those dates. Figures for other areas are 16-year averages.

2 Aerial counts corrected by species from visibility ratio obtained in the San Luis Valley.

TABLE B-69.--Nebraska - duck breeding population and species composition, 1969 and 1970

Species	1969 population	1970 population	Percent 1970 population	Percent change from 1969
Ducks:				
Dabblers:				
Mallard	31,046	28,072	23.1	- 10
Gadwall	17,810	27,282	22.4	+ 53
American widgeon	265	432	.4	+ 63
Green-winged teal	112	783	.6	+600
Blue-winged teal	18,568	20,488	16.9	+ 10
Shoveler	16,275	20,612	17.0	+ 27
Pintail	9,278	9,316	7.7	+ Tr
Subtotal	93,354	106,985	88.1	
Divers:				
Redhead	2,940	1,761	1.4	- 40
Canvasback	1,789	98	Tr	- 94
Scaup	9,271	5,552	4.6	- 40
Bufflehead	1,337	487	.4	- 63
Ruddy duck	5,936	6,669	5.5	+ 12
Subtotal	21,273	14,567	11.9	
Total ducks	114,627	121,552	100.0	+ 6

TABLE B-70.--Nevada - waterfowl nesting pair counts by species, 1968-1970

Species	1968	1969	1970
Ducks:			
Dabblers:			
Mallard	649	695	674
Gadwall	682	883	1,011
Cinnamon teal	1,217	1,576	2,600
Shoveler	87	132	111
Pintail	275	292	345
Other	128	--	62
Subtotal	2,910	3,578	4,803
Divers:			
Redhead	1,311	2,339	2,043
Canvasback	71	424	10
Ruddy duck	309	605	789
Other	--	--	57
Subtotal	1,691	3,368	2,899
Total ducks	4,729	7,310	7,702
Geese:			
Canada goose	--	605	407
Grand total	4,729	7,915	8,109

TABLE B-71.--Nevada - waterfowl production index by species, 1969 and 1970

Species	Total broods		Total young	
	1969	1970	1969	1970
Ducks:				
Dabblers:				
Mallard	133	182	1,243	1,246
Gadwall	233	305	2,517	2,141
Green-winged teal	--	13	60	79
Cinnamon teal	506	649	3,920	3,925
Shoveler	41	64	398	421
Pintail	101	96	759	597
Subtotal	1,014	1,312	8,897	8,427
Divers:				
Redhead	670	662	6,074	4,012
Canvasback	21	32	1,352	155
Ruddy duck	257	324	1,421	1,488
Other	--	7	--	37
Subtotal	948	1,025	8,847	5,692
Unclassified:	--	25	--	161
Subtotal	--	25	--	161
Total ducks	1,962	2,362	17,744	14,280
Geese:				
Canada goose	142	--	709	429
Grand total	2,104	2,362	18,453	14,709

Table C-1--Factors used to adjust survey statistics to include the activities of junior hunters

Estimate	Junior hunter adjustment factors			
	Atlantic Flyway	Mississippi Flyway	Central Flyway	Pacific & Alaska Flyway
Ducks bagged (including sea ducks)	1.03621	1.04655	1.06055	1.04985
Geese bagged	1.02402	1.03369	1.04110	1.04508
Coots bagged	1.08302	1.09034	1.10147	1.09415
Days hunted	1.05174	1.07003	1.08559	1.08708
Ducks lost	1.03641	1.05699	1.07053	1.06152
Geese lost	1.01573	1.03738	1.07067	1.07411
Coots lost	1.08247	1.10282	1.10400	1.10685

Table C-2--Factors used to adjust survey statistics for memory and prestige bias

Estimate	Memory and prestige response bias factors			
	Atlantic Flyway	Mississippi Flyway	Central Flyway	Pacific & Alaska Flyway
Ducks bagged (including sea ducks)	0.86925	0.77656	0.73902	0.78952
Geese bagged	0.80428	0.84800	0.86838	0.85159
Coots bagged	0.60692	0.63668	0.78878	0.59248

TABLE C-3--Total retrieved (by species) and unretrieved duck and coot kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)[1]

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Retrieved duck kill:							
Mallard	1968	15,900	1,002,300	539,800	846,300	267,800	2,672,100
	1969	13,400	1,121,400	759,100	1,416,800	331,500	3,642,100
	Percent change	- 16	+ 12	+ 41	+ 67	+ 24	+ 36
Domestic mallard	1968	0	400	100	3,100	5,700	9,300
	1969	0	700	200	2,400	3,600	6,800
	Percent change	0	+ 75	+100	- 23	- 37	- 27
Black duck	1968	0	0	1,000	70,900	303,300	375,200
	1969	0	0	1,700	85,800	309,400	396,900
	Percent change	0	0	+ 70	+ 21	+ 2	+ 6
Black X Mallard	1968	0	0	200	2,300	9,000	11,500
	1969	0	0	0	7,200	10,200	17,300
	Percent change	0	0	--	+213	+ 13	+ 50
Mottled duck	1968	0	0	35,600	30,200	20,300	86,100
	1969	0	0	61,400	30,800	13,100	105,300
	Percent change	0	0	+ 72	+ 2	- 35	+ 22
Gadwall	1968	600	96,100	105,000	90,000	18,700	310,400
	1969	600	114,900	332,600	185,000	33,800	667,000
	Percent change	0	+ 20	+217	+106	+ 81	+115
American widgeon	1968	9,700	426,400	79,500	124,900	41,600	682,000
	1969	8,500	481,500	169,600	209,100	82,300	951,000
	Percent change	- 12	+ 13	+113	+ 67	+ 98	+ 39

Note: Individual columns rounded separately. Totals do not check exactly as result.

TABLE C-3--Total retrieved (by species) and unretrieved duck and coot kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)--continued[1]

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Retrieved duck kill, continued:							
Green-winged teal	1968	11,300	488,700	155,900	280,900	127,700	1,064,600
	1969	7,700	556,200	313,900	368,400	164,400	1,410,600
	Percent change	- 32	+ 14	+101	+ 31	+ 29	+ 33
Blue-winged and cinnamon teal	1968	400	56,000	26,400	91,400	23,700	197,900
	1969	100	61,500	267,200	507,000	54,100	889,800
	Percent change	- 75	+ 10	++	+455	+128	+350
Shoveler	1968	5,800	181,000	37,200	43,600	9,000	276,600
	1969	1,400	287,000	113,100	94,700	15,000	511,100
	Percent change	- 76	+ 59	+204	+117	+ 67	+ 85
Pintail	1968	18,900	567,400	91,400	96,900	24,600	799,200
	1969	7,700	1,121,200	164,900	206,500	44,300	1,544,500
	Percent change	- 59	+ 98	+ 80	+113	+ 80	+ 93
Wood duck	1968	0	30,700	26,800	323,400	221,800	602,700
	1969	0	40,700	81,700	591,900	261,600	975,800
	Percent change	0	+ 33	+205	+ 83	+ 18	+ 62
Redhead	1968	100	18,400	16,600	25,300	3,500	63,900
	1969	0	37,900	79,600	86,900	10,800	215,300
	Percent change	--	+106	+380	+243	+209	+237
Canvasback	1968	100	18,200	7,400	23,500	14,700	63,900
	1969	300	27,200	31,200	30,200	42,700	131,600
	Percent change	+200	+ 49	+322	+ 29	+190	+106

Note: Individual columns rounded separately. Totals do not check exactly as result.

TABLE C-3--Total retrieved (by species) and unretrieved duck and coot kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)--continued [1]

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Retrieved duck kill, continued:							
Greater scaup	1968	1,200	16,400	500	26,800	35,800	80,800
	1969	1,400	22,500	1,100	27,100	64,600	116,600
	Percent change	+ 17	+ 37	+120	+ 1	+ 80	+ 44
Lesser scaup	1968	1,600	25,700	31,500	108,100	22,400	189,200
	1969	600	41,800	52,700	311,700	112,600	519,400
	Percent change	- 63	+ 63	+ 67	+188	+403	+175
Ring-necked duck	1968	0	22,200	21,700	156,300	69,200	269,300
	1969	100	25,900	47,400	230,100	79,000	382,400
	Percent change	++	+ 17	+118	+ 47	+ 14	+ 42
Goldeneyes	1968	2,300	21,400	2,700	22,000	22,500	70,700
	1969	2,000	33,700	3,500	40,800	24,900	104,900
	Percent change	- 13	+ 57	+ 30	+ 85	+ 11	+ 48
Bufflehead	1968	1,000	22,100	7,700	31,900	29,100	91,700
	1969	400	26,800	14,100	63,700	43,600	148,700
	Percent change	- 60	+ 21	+ 83	+100	+ 50	+ 62
Ruddy duck	1968	0	14,700	1,500	5,900	4,700	26,800
	1969	0	29,700	16,400	28,200	10,300	84,700
	Percent change	0	+102	++	+378	+119	+216
Oldsquaw	1968	100	0	100	300	5,200	5,700
	1969	600	900	0	1,100	12,000	14,600
	Percent change	+500	++	--	+267	+131	+156

Note: Individual columns rounded separately. Totals do not check exactly as result.

TABLE C-3--Total retrieved (by species) and unretrieved duck and coot kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)--continued [1]

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Retrieved duck kill, continued:							
Eiders	1968	0	200	0	100	5,900	6,200
	1969	0	0	0	100	6,500	6,600
	Percent change	0	--	0	0	+ 10	+ 6
Scoters	1968	200	9,400	100	3,300	42,800	55,800
	1969	2,100	6,500	800	8,100	53,100	70,600
	Percent change	++	- 31	+700	+145	+ 24	+ 27
Hooded merganser	1968	0	3,300	1,600	15,900	24,200	45,000
	1969	100	2,400	3,200	19,500	17,900	43,100
	Percent change	++	- 27	+100	+ 23	- 26	- 4
Other mergansers	1968	500	3,500	700	3,300	9,700	17,700
	1969	100	4,500	1,200	4,500	9,000	19,400
	Percent change	- 80	+ 29	+ 71	+ 36	- 7	+ 10
Other ducks	1968	400	800	0	300	200	1,700
	1969	0	1,600	1,600	1,900	400	5,600
	Percent change	--	+100	++	+533	+100	+229
Total	1968	70,100	3,025,400	1,190,900	2,426,900	1,362,900	8,076,200
	1969	46,900	4,046,500	2,518,100	4,559,500	1,810,500	12,981,600
	Percent change	- 33	+ 34	+111	+ 88	+ 33	+ 61

Note: Individual columns rounded separately. Totals do not check exactly as result.

TABLE C-3--Total retrieved (by species) and unretrieved duck and coot kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)--continued [1]

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Unretrieved duck kill:	1968	11,800	621,900	269,200	642,400	321,500	1,866,900
	1969	9,400	780,700	601,200	1,102,400	429,500	2,923,200
	Percent change	- 20	+ 26	+123	+ 72	+ 34	+ 57
Total duck kill	1968	81,900	3,647,300	1,460,100	3,069,300	1,684,400	9,943,100
	1969	56,300	4,827,300	3,119,300	5,661,900	2,240,000	15,904,800
	Percent change	- 31	+ 32	+114	+ 84	+ 33	+ 60
Retrieved coot kill	1968	400	87,100	31,000	246,200	60,600	425,300
	1969	400	195,000	79,200	485,700	117,200	877,400
	Percent change	0	+124	+155	+ 97	+ 93	+106
Unretrieved coot kill	1968	300	52,000	15,600	81,800	19,300	169,000
	1969	100	105,100	34,200	120,200	37,800	297,400
	Percent change	- 67	+102	+119	+ 47	+ 96	+ 76
Total coot kill	1968	700	139,100	46,700	328,000	79,900	594,300
	1969	500	300,100	113,400	605,900	154,900	1,174,800
	Percent change	- 29	+116	+143	+ 85	+ 94	+ 98

[1] Includes ducks bagged during all special duck seasons except the experimental October San Luis Valley season in Colorado.

TABLE C-4--Total retrieved (by species) and unretrieved goose kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Retrieved kill:							
Canada goose[1]	1968	7,800	160,300	84,400	159,900	177,600	589,900
	1969	14,200	195,000	117,000	194,400	247,200	767,800
	Percent change	+ 82	+ 22	+ 39	+ 22	+ 39	+ 30
Snow goose	1968	1,100	63,800	56,500	32,800	0	154,200
	1969	700	84,400	115,500	73,100	0	273,600
	Percent change	- 36	+ 32	+104	+123	0	+ 77
Blue goose	1968	0	0	23,100	48,300	0	71,400
	1969	0	0	72,100	148,400	500	221,000
	Percent change	0	0	+212	+207	++	+210
White-fronted goose	1968	900	51,700	19,900	7,100	0	79,600
	1969	1,200	72,000	29,400	44,900	0	147,600
	Percent change	+ 33	+ 39	+ 48	+532	0	+ 85
Brant	1968	0	8,800	0	0	28,800	37,500
	1969	2,400	10,000	0	0	20,300	32,700
	Percent change	++	+ 14	0	0	- 30	- 13

Note: Individual columns rounded separately. Totals do not check exactly as result.

TABLE C-4--Total retrieved (by species) and unretrieved goose kill in the United States during the 1968 and 1969 hunting seasons (retrieved kill estimates adjusted for response bias; all estimates include kill by junior hunters)--continued

	Season	Alaska	Pacific Flyway	Central Flyway	Mississippi Flyway	Atlantic Flyway	United States total
Retrieved kill, continued:							
Others and unknown	1968	400[2]	0	0	0	0	400
	1969	700[2]	2,500[3]	0	0	0	3,200
	Percent change	+ 75	++	0	0	0	++
Total	1968	10,300	284,500	183,900	248,000	206,300	933,000
	1969	19,200	363,900	334,000	460,800	268,000	1,445,900
	Percent change	+ 86	+ 28	+ 82	+ 86	+ 30	+ 55
Unretrieved kill	1968	1,900	52,300	30,300	42,700	24,000	151,200
	1969	3,100	53,300	54,000	61,100	37,500	209,000
	Percent change	+ 63	+ 2	+ 78	+ 43	+ 56	+ 38
Total kill	1968	12,200	336,800	214,200	290,700	230,300	1,084,200
	1969	22,300	417,200	387,900	521,900	305,500	1,654,900
	Percent change	+ 83	+ 24	+ 81	+ 80	+ 33	+ 53

[1]Includes all subspecies.
[2]Emperor goose.
[3]Ross' goose.

TABLE C-5--Waterfowl hunting activity and bags of ducks and geese in Alaska and the Pacific Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Alaska:									
1968	6-12	105	12,320	4.06	54,400	6.86	88,700	0.94	12,000
1969	6-18	105	13,130	3.52	50,200	4.31	59,400	1.64	22,500
Percent change			+ 7	- 13	- 8	- 37	- 33	+ 74	+ 88
Arizona:									
1968	5-10	86	10,120	4.69	51,600	5.09	54,100	0.29	3,100
1969	5-10	86	12,580	5.22	71,400	7.23	95,500	0.13	1,700
Percent change			+ 24	+ 11	+ 38	+ 42	+ 77	- 55	- 45
California:									
1968	6-6	86	159,960	6.04	1,050,100	10.10	1,696,200	1.29	215,800
1969	6-6	86	172,870	6.86	1,289,200	15.48	2,808,900	1.47	265,700
Percent change			+ 8	+ 14	+ 23	+ 53	+ 66	+ 14	+ 28
Colorado:[1]									
1968	5-10	86	3,500	5.03	19,200	7.20	26,500	0.09	300
1969	5-10	86	3,570	5.46	21,200	6.00	22,500	0.07	300
Percent change			+ 2	+ 9	+ 10	- 17	- 15	- 22	0
Idaho:									
1968	6-6	86	29,280	5.59	178,000	9.51	292,200	0.44	13,500
1969	6-6	86	30,900	7.11	238,700	10.54	341,800	0.60	19,500
Percent change			+ 6	+ 27	+ 34	+ 11	+ 17	+ 36	+ 44

TABLE C-5--Waterfowl hunting activity and bags of ducks and geese in Alaska and the Pacific Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Montana:[1]									
1968	5-10	86	19,710	4.94	105,900	6.09	126,000	0.26	5,400
1969	5-10	86	19,710	6.02	128,800	8.84	184,800	0.34	7,100
Percent change			0	+ 22	+ 22	+ 45	+ 47	+ 31	+ 31
Nevada:									
1968	5-10	86	12,460	5.95	80,600	9.27	121,300	0.55	7,200
1969	5-10	86	13,170	5.05	72,200	10.21	141,100	0.33	4,600
Percent change			+ 6	- 15	- 10	+ 10	+ 16	- 40	- 36
New Mexico:[1]									
1968	5-10	86	1,210	4.80	6,300	5.31	6,800	0	0
1969	5-10	86	830	4.50	4,100	4.66	4,100	0	0
Percent change			- 31	- 6	- 35	- 12	- 40	0	0
Oregon:									
1968	5-10	86	48,160	6.46	338,000	8.66	437,800	0.75	37,800
1969	5-10	86	54,760	6.40	381,200	8.95	514,700	0.88	50,400
Percent change			+ 14	- 1	+ 13	+ 3	+ 18	+ 17	+ 33
Utah:									
1968	5-10	86	33,750	5.51	202,000	10.33	365,900	0.26	9,100
1969	5-10	86	33,870	7.16	263,600	9.56	339,900	0.49	17,400
Percent change			0	+ 30	+ 30	- 7	- 7	+ 88	+ 91

TABLE C-5--Waterfowl hunting activity and bags of ducks and geese in Alaska and the Pacific Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Washington:									
1968	5-10	86	72,210	5.74	450,900	9.18	696,200	0.53	40,200
1969	5-10	86	80,130	7.03	612,600	7.85	660,400	0.71	59,700
Percent change			+ 11	+ 22	+ 36	- 14	- 5	+ 34	+ 49
Wyoming:[1]									
1968	6-6	86	1,570	5.13	8,700	5.61	9,200	1.11	1,800
1969	6-6	86	1,550	4.54	7,700	7.20	11,700	0.59	1,000
Percent change			- 1	- 12	- 11	+ 28	+ 27	- 47	- 44
Flyway total:									
1968	--	--	391,910	5.85	2,491,400	9.31	3,832,000	0.82	334,100
1969	--	--	423,960	6.71	3,090,700	11.52	5,125,300	0.97	427,200
Percent change			+ 8	+ 15	+ 24	+ 24	+ 34	+ 18	+ 28

[1]Includes only that portion of the State lying within the Pacific Flyway.

TABLE C-6--Total numbers of duck stamps sold and their proportionate distribution among nonhunters, active hunters, and successful hunters in Alaska and the Pacific Flyway during the 1968 and 1969 hunting seasons

State	1968 -- Final sales report				1969 -- Final sales report			
	Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were: Active	Successful	Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were: Active	Successful
Alaska	12,411	0.74	72	60	13,281	1.13	72	56
Arizona	10,196	0.76	78	59	12,745	1.28	82	68
California	162,622	1.64	88	73	175,628	1.57	89	78
Colorado[1]	3,526	0.75	83	69	3,584	0.31	86	69
Idaho	29,350	0.25	84	74	30,929	0.09	85	74
Montana[1]	19,745	0.20	80	65	19,912	1.00	86	76
Nevada	12,491	0.29	84	67	13,220	0.38	83	64
New Mexico[1]	1,215	0.16	82	71	833	0.17	83	73
Oregon	48,261	0.21	81	65	55,122	0.65	85	70
Utah	33,864	0.35	90	79	33,928	0.17	91	79
Washington	72,290	0.11	81	66	80,565	0.54	85	67
Wyoming[1]	1,576	0.52	81	68	1,554	0.00	86	76
Flyway total	395,136	0.82	85	70	428,020	0.97	87	74

[1]Includes only that portion of the State lying within the Pacific Flyway.

TABLE C-7--Waterfowl hunting activity and bags of ducks and geese in the Central Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)[1]

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Colorado:[2]									
1968	3-6	33	28,340	4.24	130,500	3.02	90,600	0.25	7,300
1969	4-8	33	31,220	5.92	200,800	4.28	142,300	0.32	10,500
Percent change			+ 10	+ 40	+ 54	+ 42	+ 57	+ 28	+ 44
Kansas:									
1968	4-8	30	44,320	5.38	258,800	4.36	204,700	0.17	7,800
1969	4-8	36[3]	53,480	5.99	347,700	6.30	357,300	0.51	28,600
Percent change			+ 21	+ 11	+ 34	+ 44	+ 75	+200	+267
Montana:[2]									
1968	3-6	33	6,050	4.68	30,700	4.53	29,100	0.40	2,500
1969	4-8	33	7,320	5.14	40,800	6.01	47,900	0.75	5,700
Percent change			+ 21	+ 10	+ 33	+ 33	+ 65	+ 88	+128
Nebraska:									
1968	3-6	36[3]	33,800	6.63	243,300	5.23	187,400	0.63	22,200
1969	4-8	40	41,940	7.43	338,300	8.35	371,400	0.59	25,800
Percent change			+ 24	+ 12	+ 39	+ 60	+ 98	- 6	+ 16
New Mexico:[2]									
1968	3-6	40	5,180	3.82	21,500	4.68	25,700	0.36	2,000
1969	4-8	33	4,840	5.06	26,600	6.14	31,800	0.14	700
Percent change			- 7	+ 32	+ 24	+ 31	+ 24	- 61	- 65
North Dakota:									
1968	4-8	30	39,730	5.91	254,900	5.93	249,700	0.70	29,100
1969	4-8	40	42,370	7.73	355,400	11.85	532,500	1.69	74,700
Percent change			+ 7	+ 31	+ 39	+100	+113	+141	+157

TABLE C-7--Waterfowl hunting activity and bags of ducks and geese in the Central Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued[1]

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Oklahoma:									
1968	3-6	36[3]	25,120	4.58	124,800	3.58	95,300	0.15	3,900
1969	4-8	36[3]	30,430	5.42	178,900	5.85	188,800	0.41	13,000
Percent change			+ 21	+ 18	+ 43	+ 63	+ 98	+173	+233
South Dakota:									
1968	3-6	36[3]	38,210	5.32	220,600	4.10	166,300	0.88	35,100
1969	4-8	40	39,740	7.77	335,300	8.93	376,200	2.07	85,700
Percent change			+ 4	+ 46	+ 52	+118	+126	+135	+144
Texas:									
1968	4-8	30	94,770	4.22	434,000	5.28	530,700	1.02	100,200
1969	4-8	55	114,790	5.97	744,000	10.86	1,322,000	1.16	138,100
Percent change			+ 21	+ 41	+ 71	+106	+149	+ 14	+ 38
Wyoming:[2]									
1968	3-6	33	4,950	6.17	33,200	6.07	31,900	0.36	1,900
1969	4-8	33	5,500	5.38	32,100	6.30	37,000	0.31	1,800
Percent change			+ 11	- 13	- 3	+ 4	+ 16	- 14	- 5
Flyway total:									
1968	--	--	320,460	5.04	1,752,100	4.74	1,611,500	0.63	211,800
1969	--	--	371,600	6.45	2,599,900	8.65	3,407,400	0.99	384,700
Percent change			+ 16	+ 28	+ 48	+ 82	+111	+ 57	+ 82

[1]Includes ducks bagged during the regular season and all special seasons except the experimental San Luis Valley season in Colorado.
[2]Includes only that portion of the State lying within the Central Flyway.
[3]Indicates split season.

Table C-8--Total numbers of duck stamps sold and their proportionate distribution among nonhunters, active hunters, and successful hunters in the Central Flyway during the 1968 and 1969 hunting seasons

State	1968--Final sales report				1969--Final sales report			
	Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were:		Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were:	
			Active	Successful			Active	Successful
Colorado[1]	28,554	0.75	74	54	31,312	0.31	85	68
Kansas	44,601	0.64	78	57	53,721	0.45	88	74
Montana[1]	6,066	0.20	73	61	7,394	1.00	82	70
Nebraska	34,090	0.85	85	66	42,116	0.43	89	77
New Mexico[1]	5,184	0.16	83	68	4,844	0.17	83	69
North Dakota	39,993	0.67	84	68	42,395	0.07	95	91
Oklahoma	25,179	0.25	76	51	30,528	0.32	85	68
South Dakota	38,280	0.18	83	65	40,043	0.77	90	82
Texas	96,031	1.31	79	60	115,899	0.96	85	73
Wyoming[1]	4,979	0.52	77	66	5,499	0.00	83	74
Flyway total	322,957	0.77	80	61	373,751	0.58	88	76

[1]Includes only that portion of the State lying within the Central Flyway.

TABLE C-9--Waterfowl hunting activity and bags of ducks and geese in the Mississippi Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)[1]

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Alabama:									
1968	3-6	30	13,940	5.39	80,400	3.31	48,300	0.20	2,900
1969	4-8	30	14,400	4.83	74,400	5.80	87,500	0.33	4,900
Percent change			+ 3	- 10	- 7	+ 75	+ 81	+ 65	+ 69
Arkansas:									
1968	3-6	20	27,720	5.83	172,800	6.57	190,600	0.03	700
1969	4-8	30	33,990	6.67	242,800	8.98	319,600	0.03	1,100
Percent change			+ 23	+ 14	+ 41	+ 37	+ 68	0	+ 57
Illinois:									
1968	3-6	30	58,350	5.83	363,800	3.27	199,900	0.44	26,500
1969	4-8	30	68,440	5.80	424,400	4.87	348,600	0.57	40,000
Percent change			+ 17	- 1	+ 17	+ 49	+ 74	+ 30	+ 51
Indiana:									
1968	3-6	27[2]	21,690	4.40	102,100	2.35	53,400	0.22	4,800
1969	4-8	27[2]	24,640	4.70	123,800	3.33	85,700	0.40	10,200
Percent change			+ 14	+ 7	+ 21	+ 42	+ 60	+ 82	+113
Iowa:									
1968	3-6	30	45,430	5.94	288,900	2.77	131,800	0.67	31,500
1969	4-8	30	54,330	7.31	425,100	5.73	325,900	1.30	73,200
Percent change			+ 20	+ 23	+ 47	+107	+147	+ 94	+132
Kentucky:									
1968	3-6	30	7,510	5.07	40,700	2.22	17,400	0.82	6,400
1969	4-8	30	7,840	6.96	58,300	2.65	21,700	1.20	9,700
Percent change			+ 4	+ 37	+ 43	+ 19	+ 25	+ 46	+ 52

TABLE C-9--Waterfowl hunting activity and bags of ducks and geese in the Mississippi Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued[1]

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Louisiana:									
1968	3-6	30	89,870	5.29	508,900	7.03	661,600	0.65	60,600
1969	4-8	40	104,960	6.78	761,000	13.12	1,441,300	1.27	137,300
Percent change			+ 17	+ 28	+ 50	+ 87	+118	+ 95	+127
Michigan:									
1968	3-6	30	88,010	5.01	471,500	2.74	252,500	0.26	23,200
1969	4-8	40	100,560	5.47	588,400	4.11	432,800	0.35	36,100
Percent change			+ 14	+ 9	+ 25	+ 50	+ 71	+ 35	+ 56
Minnesota:									
1968	3-6	27[2]	140,000	5.05	757,200	5.20	761,600	0.15	21,400
1969	4-8	40	143,480	6.38	979,000	9.36	1,404,800	0.54	80,500
Percent change			+ 2	+ 26	+ 29	+ 80	+ 84	+260	+276
Mississippi:									
1968	3-6	30	17,000	4.58	83,400	5.33	94,800	0.09	1,600
1969	4-8	30	21,360	5.45	124,600	9.05	202,400	0.21	4,500
Percent change			+ 26	+ 19	+ 49	+ 70	+114	+133	+181
Missouri:									
1968	3-6	30	41,860	5.77	258,300	3.14	137,600	1.52	65,900
1969	4-8	30	50,070	6.00	321,500	4.97	260,500	1.22	63,100
Percent change			+ 20	+ 4	+ 24	+ 58	+ 89	- 20	- 4
Ohio:									
1968	3-6	26[2]	28,260	5.71	172,500	3.74	110,700	0.28	8,200
1969	4-8	40	34,960	5.76	215,300	4.38	160,200	0.31	11,100
Percent change			+ 24	+ 1	+ 25	+ 17	+ 45	+ 11	+ 35

TABLE C-9--Waterfowl hunting activity and bags of ducks and geese in the Mississippi Flyway during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued[1]

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Tennessee:									
1968	3-6	30	21,880	5.55	129,900	3.95	90,400	0.38	8,500
1969	4-8	30	22,780	6.00	146,300	3.23	77,100	0.18	4,300
Percent change			+ 4	+ 8	+ 13	- 18	- 15	- 53	- 49
Wisconsin:									
1968	3-6	30	104,190	5.95	663,700	3.43	374,400	0.28	30,100
1969	4-8	40	121,690	6.89	897,300	5.52	703,400	0.54	67,300
Percent change			+ 17	+ 16	+ 35	+ 61	+ 88	+ 93	+124
Flyway total:									
1968	--	--	705,710	5.42	4,094,000	4.24	3,125,200	0.40	292,400
1969	--	--	803,490	6.26	5,382,100	6.98	5,871,400	0.65	543,400
Percent change			+ 14	+ 15	+ 31	+ 65	+ 88	+ 63	+ 86

[1]Includes ducks bagged during the regular season and all special seasons except the experimental San Luis Valley season in Colorado.
[2]Indicates split season.

TABLE C-10--Total numbers of duck stamps sold and their proportionate distribution among nonhunters, active hunters, and successful hunters in the Mississippi Flyway during the 1968 and 1969 hunting seasons

State	1968--Final sales report				1969--Final sales report			
	Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were:		Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were:	
			Active	Successful			Active	Successful
Alabama	13,937	0	81	58	14,498	0.66	90	70
Arkansas	27,879	0.57	87	71	34,211	0.65	90	77
Illinois	59,403	1.77	87	63	69,706	1.82	89	68
Indiana	22,048	1.62	82	52	25,036	1.59	88	62
Iowa	45,753	0.71	82	58	54,807	0.88	91	73
Kentucky	7,545	0.51	82	55	7,851	0.21	87	53
Louisiana	90,278	0.45	86	68	105,274	0.30	85	77
Michigan	88,742	0.82	85	58	101,562	0.99	90	69
Minnesota	140,934	0.66	92	70	144,562	0.75	95	84
Mississippi	17,053	0.32	85	64	21,358	0.00	84	70
Missouri	42,268	0.96	84	63	50,487	0.82	90	73
Ohio	28,911	2.27	88	66	35,841	2.45	91	67
Tennessee	21,880	0	89	59	23,104	1.40	92	70
Wisconsin	105,114	0.88	85	65	122,291	0.49	91	75
Flyway total	711,745	0.85	87	64	810,588	0.87	90	74

TABLE C-11--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway and in the United States during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Connecticut:									
1968	3-6	45[1]	11,510	4.61	55,700	3.97	47,200	0.28	3,300
1969	3-6	45[1]	12,560	4.95	65,400	3.87	50,200	0.15	2,000
Percent change			+ 9	+ 7	+ 17	- 3	+ 6	- 46	- 39
Delaware:									
1968	3-6	50	10,980	6.24	72,000	3.65	41,500	2.99	33,600
1969	3-6	45[1]	11,600	7.79	95,100	4.86	58,400	2.64	31,300
Percent change			+ 6	+ 25	+ 32	+ 33	+ 41	- 12	- 7
Florida:									
1968	4-8	36[1]	26,880	5.42	153,300	7.10	197,800	0.01	400
1969	4-8	47	32,960	5.69	197,100	7.80	266,500	0.02	600
Percent change			+ 23	+ 5	+ 29	+ 10	+ 35	+100	+ 50
Georgia:									
1968	4-8	40	11,170	4.24	49,800	4.10	47,400	0.04	500
1969	3-6	57	13,060	5.25	72,100	4.93	66,800	0.06	800
Percent change			+ 17	+ 24	+ 45	+ 20	+ 41	+ 50	+ 60
Maine									
1968	3-6	45[1]	14,560	4.81	73,700	5.66	84,600	0.05	800
1969	3-6	45[1]	15,740	5.56	92,000	6.56	106,400	0.14	2,300
Percent change			+ 8	+ 16	+ 25	+ 16	+ 26	+180	+188

TABLE C-11--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway and in the United States during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Maryland:[2]									
1968	3-6	50	30,910	6.05	193,200	2.95	92,800	3.31	101,800
1969	3-6	51[1]	36,800	7.13	285,800	5.95	234,900	3.41	131,900
Percent change			+ 19	+ 18	+ 48	+102	+153	+ 3	+ 30
Massachusetts:									
1968	3-6	45[1]	23,310	4.80	117,700	3.56	85,700	0.25	6,000
1969	3-6	50	25,310	6.02	160,200	4.03	104,700	0.26	6,600
Percent change			+ 9	+ 25	+ 36	+ 13	+ 22	+ 4	+ 10
New Hampshire:									
1968	3-6	50	7,590	4.99	39,900	2.71	21,300	0.10	800
1969	3-6	45[1]	8,770	5.75	53,000	3.01	27,300	0.07	700
Percent change			+ 16	+ 15	+ 33	+ 11	+ 28	- 30	- 13
New Jersey:									
1968	3-6	45[1]	29,560	4.88	151,700	4.15	127,100	1.13	34,200
1969	3-6	45[1]	32,090	5.65	190,600	4.50	149,500	1.37	45,000
Percent change			+ 9	+ 16	+ 26	+ 8	+ 18	+ 21	+ 32
New York:									
1968	3-6	50	84,490	4.46	396,600	3.36	293,900	0.42	36,700
1969	3-6	57	96,590	5.65	573,600	4.07	406,600	0.68	67,000
Percent change			+ 14	+ 27	+ 45	+ 21	+ 38	+ 62	+ 83

TABLE C-11--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway and in the United States during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
North Carolina:[2]									
1968	3-6	50	21,990	5.36	123,700	4.41	100,200	0.34	7,700
1969	3-6	57	26,660	6.87	193,400	4.30	119,400	0.20	5,800
Percent change			+ 21	+ 28	+ 56	- 2	+ 19	- 41	- 25
Pennsylvania:									
1968	3-6	50	56,990	4.31	258,300	2.05	121,200	0.28	16,400
1969	3-6	57	66,160	4.48	311,600	2.16	148,100	0.32	21,600
Percent change			+ 16	+ 4	+ 21	+ 5	+ 22	+ 14	+ 32
Rhode Island:									
1968	3-6	50	2,910	7.25	22,200	5.90	17,800	0.40	1,200
1969	3-6	50	3,270	6.43	22,100	3.85	13,000	0.38	1,300
Percent change			+ 12	- 11	0	- 35	- 27	- 5	+ 8
South Carolina:									
1968	3-6	50	18,800	6.96	137,600	6.91	134,700	0.03	600
1969	4-8	47	19,720	6.67	138,300	7.33	149,800	0.04	700
Percent change			+ 5	+ 4	+ 1	+ 6	+ 11	+ 33	+ 17
Vermont:									
1968	3-6	50	5,850	5.35	33,000	4.57	27,700	0.06	400
1969	3-6	50	6,230	5.15	33,700	5.12	33,100	0.16	1,000
Percent change			+ 6	- 4	+ 2	+ 12	+ 19	+167	+150

TABLE C-11--Waterfowl hunting activity and bags of ducks and geese in the Atlantic Flyway and in the United States during the 1968 and 1969 hunting seasons (estimates unadjusted for response bias; totals include activity by junior hunters)--continued

State and hunting season	Daily duck bag and possession limits	Days in duck season	Number of adult hunters (potential)	Days per adult hunter	Total hunter-days	Seasonal duck bag per adult hunter	Total duck bag	Seasonal goose bag per adult hunter	Total goose bag
Virginia:[2]									
1968	3-6	50	18,580	5.23	101,200	6.47	120,800	0.59	11,900
1969	3-6	50	19,890	5.52	120,500	6.72	142,400	0.63	14,600
Percent change			+ 7	+ 6	+ 19	+ 4	+ 18	+ 7	+ 23
West Virginia:									
1968	3-6	45[1]	1,760	4.83	8,900	3.51	6,400	0.12	200
1969	3-6	51[1]	1,860	4.78	9,400	2.96	5,700	0.07	100
Percent change			+ 6	- 1	+ 6	- 16	- 11	- 42	- 50
Flyway total:									
1968	--	--	377,850	5.00	1,988,300	4.00	1,567,900	0.66	256,500
1969	--	--	429,250	5.79	2,613,900	4.68	2,082,900	0.76	333,300
Percent change			+ 14	+ 16	+ 31	+ 17	+ 33	+ 15	+ 30
United States total:									
1968	--	--	1,808,250	5.35	10,380,200	5.40	10,225,300	0.59	1,106,900
1969	--	--	2,041,430	6.27	13,736,900	7.73	16,546,300	0.81	1,711,100
Percent change			+ 13	+ 17	+ 32	+ 43	+ 62	+ 37	+ 55

[1]Indicates split season.
[2]Washington, D. C., hunters and kill allocated to Maryland, North Carolina, and Virginia.

TABLE C-12--Total numbers of duck stamps sold and their proportionate distribution among nonhunters, active hunters, and successful hunters in the Atlantic Flyway and in the United States during the 1968 and 1969 hunting seasons

State	1968--Final sales report				1969--Final sales report			
	Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were: Active	Successful	Total duck stamps sold	Percent sold to nonhunters	Percent of potential adult waterfowl hunters who were: Active	Successful
Connecticut	12,005	4.15	73	55	12,889	2.59	77	53
Delaware	11,055	0.66	85	68	11,657	0.48	89	71
District of Columbia	2,589	3.92	84	57	2,990	0.44	91	69
Florida	27,057	0.64	81	65	33,183	0.67	89	74
Georgia	11,228	0.51	81	56	13,094	0.27	86	62
Maine	14,696	0.94	85	70	15,939	1.24	90	76
Maryland	29,980	2.19	84	68	37,280	1.30	90	71
Massachusetts	23,758	1.87	78	53	25,630	1.26	83	58
New Hampshire	7,656	0.82	80	55	8,938	1.90	86	58
New Jersey	30,384	2.73	81	62	32,974	2.69	88	67
New York	86,492	2.31	75	53	98,403	1.84	84	62
North Carolina	22,090	0.95	83	61	26,760	0.37	87	62
Pennsylvania	58,055	1.84	83	55	67,224	1.59	88	57
Rhode Island	2,961	1.62	80	59	3,313	1.24	82	58
South Carolina	18,896	0.51	88	63	19,737	0.10	92	72
Vermont	5,884	0.55	80	63	6,317	1.41	86	70
Virginia	18,177	2.13	81	58	20,146	1.29	87	69
West Virginia	1,799	2.33	80	57	1,898	1.83	85	59
Flyway total	384,762	1.80	81	59	438,372	1.40	87	64
United States total[1]	1,827,011	1.03	84	64	2,064,012	0.94	88	72

[1]Does not include stamps sold at the Philatelic Agency, in Hawaii, or in Puerto Rico.

FIGURE 1.-- Waterfowl Breeding Population And Production Aerial Survey Transects And Strata

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As the Nation's principal conservation agency, the Department of the Interior has basic responsibilities for water, fish, wildlife, mineral, land, park, and recreational resources. Indian and Territorial affairs are other major concerns of America's "Department of Natural Resources."

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CONSERVATION PLEDGE

I give my pledge
as an American to save
and faithfully to defend from
waste the natural resources of
my country—its soil and
minerals, forests,
waters, and
wildlife.